COLONY OF MAURITIUS

Annual Report

OF THE

Department of Agriculture

1954

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J. ELIEL FELIX, GOVERNMENT PRINTER,
PORT LOUIS, MAURITIUS
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CONVERSION TABLE

1 Arpent	= 1,043 acres
1 Metric Ton	= 1,000 kilos
1 Long Ton	= 1,016 kilos
1 Kilo	= 1,000 grams
1 English pound	= 453·6 grams
1 Cwt.	= 50·803 kilos
1 Cord	= 9082 cubic feet
1 Gallon	= 4·546 litres

Annual Report of the Department of Agriculture for the Year 1954

Policy

Agricultural policy in Mauritius, as in any other country, is aimed at the utilization of land resources, whether public or private, to the best advantage and in the interest of all its inhabitants.

To assist Government in achieving this objective, the Board of Agriculture, Fisheries and Natural Resources was set up by Ordinance in January 1954. This Board is representative of the agricultural industries of the Colony and of the various Government Departments concerned with land utilization. It is charged with the duty of advising Government on policy. During its first year of existence it has had under consideration, amongst other matters, the utilization of Crown Lands and the coastal belt of Pas Geometriques, sand quarries, irrigation problems, fisheries policy, oyster culture, Land Settlement rentals and maize cultivation. In most instances, reports on these matters have been submitted by the Board and are receiving the consideration of Government.

3. Sir Geoffrey Clay, the Agricultural Adviser to the Secretary of State for the Colonies, visited Mauritius towards the end of the year. Opportunity was taken to discuss details of current agricultural policy, and the necessary action was initiated to secure approval and implementation of the various proposals agreed upon at these discussions.

4. The Department of Agriculture has long suffered from inadequate professional staff and has been in need of reorganization of the structure of its Agricultural Division. Steps have been taken to enable recruitment of suitably qualified officers so as to allow the Experimental Stations to be put on a sound footing, the agricultural development of Rodrigues to be proceeded with and the teaching staff at the College of Agriculture to be strengthened. Reorganization of the Agricultural Division has been planned so as to bring its Extension Service into more direct contact with the small planter through posting of officers to districts and the provision therein of demonstration centres.

5. Responsibility for experimental work with sugarcane has now been assumed by the Mauritius Sugar Industry Research Institute and that body has made rapid progress with the establishment of research facilities and initiation of field and laboratory work. The Department of Agriculture is now free to devote more energy to extension work with small planters. Close co-operation has, however, been maintained with the Institute and the necessary liaison is provided for by the presence of the Director of Agriculture on its Executive Board and of other officers of the Department on its Research Advisory Committee.

6. In further connection with the sugar industry, it may be mentioned that the Department has continued to administer the Central Board, which regulates arrangements between planters and millers concerning the supply of canes. The constitution of the Central Board has been under review, and it has also been decided, after consultation with the industry through the Chamber of Agriculture, to expand the staff of the Board so as to allow increased coverage of factories and a greater number of sucrose tests to be undertaken during the 1955 crop.

7. The development of the tea industry continues to be regarded as a major item of policy, since this seems to offer the best chance of strengthening and diversifying the economy of an island at present almost solely dependent upon sugar. To this end, Government has expanded its tea plantation at Midlands, continued its advisory service to planters through the Tea Division, maintained the Tea Experimental Station at Wooton and has excised from the Forestry Programme certain Crown Lands which it is hoped to make available for lease for tea-planting during 1955.

8. The breeding policy of the Livestock Division in regard to dairy cattle has been regrettably, if perhaps unavoidably, indefinite and conflicting. On the one hand, the local population of Creole milch cattle is remarkably well adapted to environment and offers great possibility for establishment of an improved breed through selection : to this end a small herd has been built up at the Palmar Breeding Centre. On the other hand, the Extension Service of the Division has, in the absence of progenytested Creole bulls, effected an island-wide artificial insemination service using bulls, with varying amounts of Friesian blood : the result has been progressive injection of indeterminate amounts of Friesian blood into the Creole population and the disappearance of large numbers of Creole bulls, sold to the butcher. It will now be a matter of great difficulty to establish a Creole genotype or even a Creole X Friesian cross in known proportion. The whole subject of future breeding policy has been referred for expert advice, and it is hoped that in 1955 a definite long-term policy may be laid down and thereafter strictly adhered to. Apart from breeding, other methods of improving the milk supply are being pursued and will be intensified. The Extension Service of the Division is endeavouring to encourage higher standards of management and feeding, and has continued to provide a simple veterinary service to peasant stock-owners. In the former connection, the Government Maize Mill is manufacturing a relatively cheap concentrate, based on ureated molasses, the use of which it is hoped to popularize. Adequate supplies of fodder present a formidable problem in that most milk-cattle are owned by persons who do not possess land and who live in the more populated areas where communal land for fodder-production is not available. The supply of cane-tops during the crop season provides only a temporary and incomplete alleviation. The Department has recruited an officer for work on grassland and fodder problems and is continuing its experiments with ensilage and hay-making. Present indications are, however, that cost is likely to make both hay and silage uneconomic. A feature of the veterinary work of the Extension Service is the considerable increase in fertility of the cattle population resulting from the large number of cases of enucleation of ovarian cysts dealt with. The high incidence of ovarian cysts is probably due to the rather unnatural mode of existence imposed on cattle by the presence of the biting fly, *Stomoxys*, from which they are protected by life-long incarceration in small window-less byres. Control of *Stomoxys* would allow a radical improvement in methods of livestocks management, and to this end the entomologist is to start investigations.

9. The tobacco industry continues to be severely limited according to the requirements of the sole local manufacturer. Policy is directed at establishment of improved Virginia types and better curing technique with the aim of replacing imported tobacco, both leaf and manufactured, and also of finding an export market. Until these aims are achieved, no expansion is possible.

10. The fibre industry gives cause for concern, in that is is unable to operate profitably at prevailing prices. Furthermore, the local demand for sacks is likely to diminish as a result of bulk-loading of sugar. An export outlet is unlikely in the face of competition from other fibre-producing countries with lower costs.

11. It is an item of policy to encourage production of food-crops, particularly potatoes, vegetables and fruit. One means of assistance is to make available selected seed of both tropical and acclimatized temperate-type vegetables : this is being successfully done at the Barkly Experimental Station. Another project in connection with increased food-production is the study being carried out of new patterns of peasant agriculture incorporating sugar-cane in rotation with food-crops : it is hoped in due course to translate the more promising of these patterns from the Experimental Stations to the Pilot Land Settlement Scheme. In connection with fruit-production, arrangements have been made to introduce suitable plant-material, both stock and scion, with the intention of reviving the growing of citrus, which has virtually disappeared from the island due to disease.

12. Plans are in hand to enlarge and equip the College of Agriculture for the purpose of meeting the full demand of agricultural industry as well as the Department of Agriculture for trained staff.

13. Strict enforcement of regulations designed to prevent introduction of pests and diseases of plants and animals has been continued and more than ever necessary due to the appearance of the serious Fiji Disease of sugarcane in the neighbouring island of Madagascar.

14. Finally, it may be recorded with pleasure that the policy of agricultural co-operation with Reunion under the auspices of the *Comité de Collaboration Agricole Maurice-Reunion* has been maintained with mutual benefit and that Madagascar has now been admitted to this unofficial arrangement. Mauritius has accepted technicians from these territories for training in the sugar and tea industries and has, in return, received valuable assistance in matters such as the preparation of vaccines in Madagascar and the reception by Reunion of College of Agriculture Students on an instructional tour. It is also hoped to arrange for testing of Mauritius canes in Madagascar as regards resistance to Fiji Disease.

The Sugar Industry

15. As in previous years, the acreage under cane has again increased. However, although some 1,300 arpents more were reaped, sugar production was less than last year's record by 13,665 metric tons (498,560 tons as against 512,225 in 1953). This drop in production was the result of a lower yield of cane (25·4 tons per arpent as against 27·8 in 1953) only partly offset by a higher sucrose content and improved recoveries in the factory. Cane-yields were affected by sub-normal rainfall during part of the growing season and the sucrose-content (13·44 per cent), although better than last year (12·96 per cent), were still not as high as had been expected, due to excess rain in the crop season. A feature was the satisfactory recovery in the sugar factories despite a higher grinding rate. The crop of 4,280,078 metric tons of cane was

ground at an average of 67·8 tons per hour for 19·4 hours per day over 119 days and yielded 11·65 per cent of its weight as sugar. Comparison with the average figures for 1953 (4,642,740 tons of cane at 65·5 tons per hour for 19·2 hours per day over 134 days and yielding 11·03 per cent) would indicate satisfactory progress with the programme for modernization of factories and a regular supply of cane consequent on satisfactory labour conditions. Tons sugar per arpent were 2·96 as compared with 3·06 last year. Area under canes and area harvested were 178,823 and 168,442 arpents respectively as compared with 176,880 and 167,104 in 1953. As in the previous year, the main variety of cane grown was M. 134/32, bred at the former Sugar Cane Research Station of the Department, and still comprising over 80 per cent of the total cane grown. The highest yields were again obtained on factory lands, where tons cane per arpent averaged 31·0 as against 25·4 for the whole island.

16. Under the Commonwealth Sugar Agreement, Mauritius is allocated 351,000 long tons at the negotiated price out of the annual export quota of 470,000 long tons to the preferential and negotiated price markets. The negotiated price for 1954 was £41 per ton, a reduction of £1. 6. 8d. on the previous year, and the price fixed for 1955 is £40. 15. 0d., a further reduction of 5 sh. per ton. These reductions are in accordance with the price—fixing formula, and are due to a decrease in the index for supplies. The negotiated price sugars are subject to special levies for the benefit of the Labour Welfare Fund, the Rehabilitation Fund, and the Cyclone and Drought Insurance Fund, while all sugars exported contribute to the Sugar Industry Reserve Fund, the Mauritius Sugar Industry Research Institute, and the Central Board.

17. Of the exports during 1954 (part of which came from the 1953 crop), in the main the negotiated price sugars went to the United Kingdom and the preferential sugars to Canada.

18. With a rapidly increasing population and continued dependence upon sugar to an almost absolute extent, it is a matter of concern to Mauritius that in 1954 world production was again in excess of estimated consumption, world prices again deteriorated, and the United Kingdom market, with large stocks on hand, showed little signs of expansion. During the next few years an increase in the Mauritius production may be confidently expected as a result of the tendency to plant all available lands to cane, the increased efficiency of factories consequent on progress of the programme of modernization and the higher yields per acre that are likely to be the outcome of the work of the new Sugar Research Institute. It is doubtful, however, whether any very appreciable increase can be marketed at remunerative prices, if indeed it can be marketed at all. In this regard, the work of the International Sugar Council to stabilize market conditions has been watched with the greatest interest.

19. The programme of modernization and re-equipment of sugar factories has continued. During the year a further 24 million rupees were spent, bringing total expenditure since inception of the scheme in 1946 to about 160 million rupees. Besides increasing efficiency, the aim is to reduce the crop period to about 100 days, so that all cane can be processed at the period of maximum sugar content. As will be noted from the earlier part of this Chapter, these objectives are being achieved. Further expenditure of around 53 million rupees is envisaged in the near future.

20. Bags for the 1954 crop were easily obtainable, partly by importation and partly from the production of the local Sack Factory. The price of imported bags has fallen and with this, under the terms of the Tripartite Agreement, that of local bags also. The average cost of bags for 1954 was Rs. 15.92 per ton of sugar as compared with Rs. 20.42 in 1953 and Rs. 26.10 in 1952.

21. Bulk loading of sugar continued, about 141,000 metric tons being exported in bulk to the United Kingdom as compared with about 151,000 tons in 1953. The system is still the somewhat inefficient one of emptying bagged sugar by hand into the ship's hold ; but during the year the Chamber of Agriculture appointed a Bulk Handling Committee to examine and report on the whole question of transport, storage, and shipping of sugar in bulk. This Committee is to have the benefit of the advice of an expert on bulk handling problems, made available by Messrs, Tate & Lyle Ltd.

22. Inland transport of sugar was also the subject of investigation by a Special Committee of the Chamber of Agriculture, and the report of this Committee, which was submitted to Government, recommended closing down of the railway and substitution of heavy road transport, with improvement of the present road system. As a pilot scheme, one sugar estate transported its sugar by road during 1954, and the results were encouraging.

23. There was a further decline in alcohol production due to the virtual disappearance of exports consequent on the depressed world market. Of the ten distilleries, only four later reduced to three, were in active operation during the year. Production amounted to 1,660,096 litres (100° G.L.) as compared with 3,207,389 litres in 1953 and nearly 6 million litres in 1952. Of this, only 28,421 litres were exported as compared with approximately 1½ million and 5 million in 1953 and 1952 respectively. The bulk of production was utilized locally as Rum or Denatured Spirit. As a result of the state of the export market, no further action has been taken by distillers in regard to the proposed storage installations for bulk shipment of alcohol. There appears little immediate prospect of a revival of the export trade in hydrated alcohol, and, under the circumstances, the Chairman of the Board of Agriculture, Fisheries and Natural Resources has re-opened the question of the possibility of manufacture of anhydrous alcohol for blending with imported petrol as a motor fuel. This, and the related matter of production of export rum, has had the attention of the Chamber of Agriculture and Distillers' Association.

24. The loss of an export market for alcohol has, however, been compensated for by an expanded market for molasses at prices which, although tending to fall, are still reasonably remunerative and becoming more stable. Of a total production of 120,465 metric tons, 89,912 tons were exported in 1954. The percentage of production exported was, therefore, 74·6 as compared with 48·0, 35·6 and 2·9 in the three years 1953, 1952 and 1951 respectively. In view of the diminished requirements of molasses by distillers, it is fortunate that a satisfactory market can be found for molasses surplus to the distillers' requirements, the estates' fertilizer needs and that used for feeding livestock.

25. No development has occurred in regard to the project that was under consideration last year for the erection of a paper mill to utilize bagasse. Some sugar factories have meanwhile acquired baling presses to enable sale of bagasse off the estate and perhaps eventually for export. The Engineering Division of the Department has been experimenting with bagasse as an absorption medium for ureated molasses, and will shortly submit a compressed and baled sample to the Colonial Products Laboratory for appraisal of its possibilities as an export cattle feed.

26. The Central Board held no less than 65 meetings during the year, more than double the number in the previous year. As is usual, the majority of these meetings were concerned with matters connected with the assessment of sugar due to planters. Departmental staff attached to the Central Board performed their normal duties in regard to registration of cane contracts, issue of permits to middle-men, inspection of weighbridges and cane testing. The Accountant of the Central Board has carried out an investigation of millers' and planters' costs, and his report will shortly be submitted to the Board. As a result of action in the Legislative Council, Government has under consideration new legislation governing the distribution between planter and miller of the sugar and other products derived from planters' canes.

Mauritius Sugar Industry Research Institute

27. This independent organization, financed by a cess on sugar exports, is the successor of the former Sugarcane Research Station of the Department of Agriculture. The Department has now relinquished responsibility for experimental work on cane, although, for the present, it maintains its research work in factory technology. The Institute continued to be housed in Departmental accommodation at Reduit, awaiting acquisition of its own offices and laboratories. Pending completion of its scientific staff, the Plant Pathologist and Entomologist of the Department co-operated in research projects of the Institute. The Institute proposes to establish a Division of Sugar Technology as from 1st January, 1956, and accordingly consideration is being given to future policy in regard to the Department's Division of Engineering, which is at present primarily devoted to work on sugar technology.

28. Close cooperation and cordial relations have been maintained between the Department of agriculture and the Institute at all times. The work of the Institute has been fully reported in its Annual Report 1954, published early in 1955 ; but, for the purposes of this Report, the following brief notes may be given.

29. Unavoidably at this early stage, a great deal of effort has had to be devoted to organization, establishment of the field stations, building and equipment of laboratories, recruitment of staff, planning, etc., but nevertheless a satisfactory start has been made with several lines of research, notably in regard to cane-breeding, nutritional studies, pathology, weed control and agricultural meteorology.

The Mauritius Chamber of Agriculture

30. As in previous years, the Chamber of Agriculture has represented agricultural interests in the Colony both through its local office and through its London representative. Besides serving as a medium for the expression of opinion by agricultural industry, the Chamber has been active in calling attention to economic and technical problems and assisting in their solution. It also perfoms a valuable function in the collection of agricultural statistics.

31. Two members of the Chamber attended the Commonwealth Sugar Agreement price-fixing talks held in London during November.

32. The co-operation and assistance that has always readily been accorded by the Chamber to the Department of Agriculture is acknowledged with appreciation. During the year the Chamber has been especially helpful in matters concerning the administration of the Central Board and the College of Agriculture (on the Advisory Board of which the Chamber is represented).

College of Agriculture

33. The College continued under the Administration of the Department of Agriculture, as has been the case since it was created in 1925. It is, however, now carried on the Colony's Estimates as a Division of the Department instead of being financed by a cess on export sugar, as was done up to August 1953.

34. The College offers a three-year course leading to a Diploma in Agriculture and a one-year course for a Certificate in Tropical Agriculture and Cane Cultivation. In addition, a short course in Sugar Analysis was started this year for the purpose of training laboratory staff for the sugar estates and the Central Board.

35. During the year, the College grounds were enlarged by transfer of land from the Agricultural Division and the Chemistry Laboratory was re-designed and re-equipped. Approval was obtained to enlarge the College buildings at an estimated cost of Rs. 280,000. and this work will be put in hand in 1955. The proposed expansion of the College is intended to permit a larger intake of students so as to satisfy the demand of agricultural industry and the Department of Agriculture for trained personnel.

36. Unfortunately, it has not yet been possible to fill the existing vacancy for a Lecturer in Agriculture at the College and staff of the Agricultural Division have assisted on a part-time basis. It is hoped that this unsatisfactory state of affairs will not long continue.

37. The total number of students in 1954 was 55, distributed as follows :—

Diploma Course	27
Tropical Agriculture and Cane Cultivation Course ...	9
Sugar Analysis Course	7
Part time...	12

38. At the annual examinations held in April 1954, five students were awarded the Pass Diploma and one the Honours Diploma. The latter was given a scholarship tenable at Louisiana State University for the purpose of studying sugar engineering. Six students completed the Second Year and seven the First Year of the Diploma Course. It may be noted that the number of failures amongst first and second year students was larger than usual, and four first year Students were required to leave the College on account of unsatisfactory work.

39. The City and Guilds of London Institute examinations in Sugar Manufacture were also held in April. Six candidates, all graduates of the College, sat for the examinations and all passed with First Class Honours.

40. As formerly, the College Advisory Board guided the affairs of the College and were of great assistance to the Principal and the Director of Agriculture in administrative matters.

Fibre

41. Due to the continued weakening in world demand and prices which began early in 1952, the future of the Mauritius fibre industry has become of immediate and grave concern. The industry operates under a Tripartite Agreement between the Sugar Millers, the fibre producers and the Government Sack Factory whereby the Sack Factory obtains its fibre requirements from the producers and disposes of its sack output to the sugar millers, prices being regulated, subject to a maximum fluctuation of 10 per cent between successive years, by the price of imported bags.

42. Fibre producers have, therefore, been seriously affected by the world market, as reflected in the Tripartite Agreement. Furthermore, although the price of fibre has decreased, the cost of production has remained at a relatively high level. During the latter part of the year, prices being paid by the Sack Factory per ton of brushed fibre were around Rs 1,272 for first grade and Rs 1,240 for second grade. These compare with an average cost of production of between Rs 1,150 and Rs 1,200, as calculated by a Chartered Accountant engaged by the Hemp Producers Syndicate. The situation becomes even more difficult next year when a further 10 percent reduction in price becomes effective.

43. While, on the one hand, the local market is rapidly becoming unremunerative, on the other hand, the export market offers no known prospects. Actually, export is forbidden under the Tripartite. Agreement; but, in view of the easy supply of cheaper imported bags, it has been agreed to waive this provision. The concession is, however, of little practical value, as, under present world conditions of slackening demand and falling prices, Mauritius is not in a favourable position to compete with other exporting countries whose costs of production are generally lower. This is borne out by the fact that Indian jute could probably be imported into Mauritius at a landed cost of about Rs. 900 per ton.

44. The already sombre picture of the industry's future has been considerably darkened by the declared intention of the sugar millers, announced last year, not to renew the Tripartite Agreement. Unless this decision is revised, the fibre industry will have no assured local market after the Agreement expires in 1958. The decision of the sugar millers was probably influenced by the higher prices which they have had to pay for local bags due to operation of the 10 per cent limitation clause of the Agreement—it is claimed that, since the implementation of the Agreement in 1950, additional expenditure to sugar millers in respect of local bags has been in excess of a million Rupees and that the price differential between local and imported bags is likely to further increase.

45. The Government Sack Factory is in an even more precarious financial position than the fibre producers. A loss of Rs. 600,000 in 1953 has been followed by a loss on this year's working of more than Rs. 800,000 and the Reserve is practically exhausted. As mentioned in last year's Report, the Sack Factory has recently been enlarged and partly modernized. Whereas it is understood that, to be fully economic at its present capacity, the production of the factory should be around 3½ million sacks per annum; output in 1954, although over 1 million more than in 1953, was still only just under 2¼ million sacks. Under existing conditions, appreciable increase in the supply of fibre is unlikely and the Board may possibly be faced at an early date with the necessity of devising ways and means of reducing overheads to

a level proportional with the relationship between capacity and actual production. The Sack Factory handled 2,187 tons of fibre, as compared with 1,197 tons in 1953. It produced 2,249,222 bags of 80 kilos capacity—1,045,472 more than in the previous year—40,049 yards of filterpress cloth, 4,510 yards of other fabrics, and nearly 16 tons of yarn for rope making. The average number of bags produced per ton of fibre was 1,049 as compared with 1,050 in 1953. During the first half of the year the Baling Factory of the Hemp Producers Syndicate was closed at the request of the Sack Factory so that loose instead of hard pressed fibre could be processed. This procedure had to be discontinued in June owing to lack of storage space for the bulky unbaled fibre ; but, now that enlargement of the Sack Factory's fibre store has been completed, the practice of delivery of fibre direct to the Sack Factory, instead of through the Syndicate's Baling Factory, is to be resumed as from the beginning of 1955. The Sack Factory also decided to take " Brushed " Fibre only, as it is expected that the use of this will result in greater efficiency than has been obtained from processing Raw Fibre.

46. Of the 40 existing fibre factories, only 36 worked during the year—3 less than last year. Inclusive of tow and cuttings, tonnage of Aloe fibre produced was 1,972 compared with 2,177 in 1953. In addition, 7 tons of Sisal fibre were produced. Of this, 1,882 tons (inclusive of nearly 67 tons of Tow) were sold to the Sack Factory and a little over 97 tons, consisting of about 4 tons of Tow and 93 of Cuttings, exported. At the end of the year there were 14,603 arpents under wild Aloe Fibre and a further 2,521 arpents in regular plantations plus another 69 arpents in course of being planted. In addition there were 625 arpents planted to Sisal.

47. The average F O.B. Value of the 60 tons of fibre actually shipped before the end of the year was Rs. 414·6 per ton, as compared with Rs. 490 last year.

48. Experimental work on cultivation and decortication was continued at the Richelieu Fibre Experimental Station. The seven spacing, variety and intercropping trials on Aloe Fibre which were planted in 1950 were cut for the second time. As with the first cut last year, the highest yields were given by the plots spaced at 5 × 5 feet and the intercultivation of Acacia *leucaena glauca* has again proved itself highly beneficial to the yield of fibre. Varietal differences, however, remain inconclusive. A further spacing trial, laid down in 1951, was reaped for the first time. In this trial, high yields were obtained from two new spacings designed to allow weeding both between and within double rows; but it is too early to draw definite conclusions. An attempt at chemical weed-control was unsuccessful, due to sensitivity of Aloe Fibre to T.C.A. Trials of fibre plants other than Aloe Fibre *Furcraea* continue. Sanseviera and Sisal have not, however, done well. A further trial of Kenaf is being prepared for 1955, while arrangements have been made for introduction of *Urena lobata* from the Gold Coast. If this latter crop should prove suited to local conditions, it would appear to offer possibilities. It is a short term annual, producing a high quality soft fibre comparable with jute, and it is relatively cheap to handle with simple machinery, both as regards cultivation and subsequent fibre-extraction. If a crop, such as this, could be remuneratively produced on sugar estates as a catch-crop between the last rattoon and subsequent replanting, it might well assist the Aloe Fibre industry by raising capacity and lowering costs in the Sack Factory, besides possibly improving the manufactured product.

49. Work at the experimental fibre decortication station has been concentrated mainly on investigation of the retting process and development of a prototype automatic leaf-feeder of increased capacity for use with existing decorticators. Tests have been continued on the relative efficiency of the various types of decorticator in use in the island's fibre factories.

50. The Hemp Producers Syndicate estimates next year's production at 1,746 tons and consumption by the Sack Factory at 2,700 tons, thus leading to a marked diminution in carry-over stocks at the end of 1955. Production of bags next year is expected to reach 2,400,000, of which 2 million will be of a new reinforced type designed for use in transporting sugar to be bulk-loaded.

51. It is to be hoped that the efforts being made to retrieve the position of the fibre industry will be successful, as this industry is of importance to the Colony's economy. This year's production of 2,249,222 bags, taken in relation to the 2,125,791 bags imported during the year, means that only about half the money was spent abroad for bags as would otherwise have been the case. Moreover, the industry provides employment for a considerable number of persons and occupies marginal land for which it would be difficult to find an alternative use.

52. The total value of local sales of fibre for the year was Rs. 2,247,573 and that of exports was Rs. 25,007. Up to the end of the year, a total of Rs. 493,100 had been borrowed from the Aloe Fibre Industry Fund through the Agricultural Bank for the improvement of plantations and factories, roughly half the total in each regard. Loans from the somewhat similar Aloe Fibre Development Fund, operated by the Hemp Producers syndicate, may be discontinued early in 1955 due to the uncertain future of the industry.

Tea

53. The area under tea again increased slightly, being about 2,823 acres at the end of the year, as against 2,586 at the end of 1953. Of the total acreage, some 2,234 acres were in bearing. Permits to plant a further 728 acres were issued during the year.

54. Except for the minor work in the withering lofts of two of them, all five tea factories have now been renovated. At least two of these factories are producing tea of quality suitable for export.

55. Production increased for the ninth consecutive year and, for the first time, exceeded a million pounds. Total production was 1,142,987 English pounds of black tea and 1,643 lb. of green tea. This compares with 907,804 lb. of black tea and 1,473 lb. of green tea last year. Production has more than doubled since 1947.

56. Exports reached the record figure of 249,673 lb., of which 89 per cent came from one factory (Bois Cheri Estates Ltd.). This tea was sold mainly to the United Kingdom ; but appreciable amounts went to Holland and South Africa with smaller quantities to France and Reunion as well, Average price realized on the London market was 6 sh. per lb. and the total c. i. f. value of exports was Rs. 591,769.

57. Imports of tea during the same period from Ceylon, Hong Kong and India totalled only 36,080 lbs. valued at Rs. 119,089. This compares with 113,470 lbs of imported tea in 1953. The marked decrease in imports would appear to be due partly to improved quality of local tea and partly to the high prices ruling in the world markets during the year.

58. Overall yield per bearing acre was in the neighbourhood of 526 lbs of manufactured black tea. This, although a marked improvement on any previous year and over 100 lbs per acre better than last year, is still low. From results obtained at the Department's Tea Experimental Station and by Bois Cheri Estates, it is now quite evident that Assam type high jat teas, properly planted, can confidently be expected to give yields in excess of 1,000 lbs of made tea per acre. For instance, the Norwood jat (introduced from Ceylon) has given yields at Bois Cheri varying between 800 and 1,000 lbs per acre according to the individual fields, while a field of Malayan jat at the Experimental Station yielded 962 lbs per acre in its second season of bearing. The low general yield at present obtaining in Mauritius is due to a number of causes, the chief of which are the inferior local jat used, the wide planting distances employed and the tendency of small-holders to over-pluck young tea. A gradual increase in yield per acre may be expected as new plantings come into bearing ; but it will be some considerable time before the inferior older fields are entirely replaced. Firstly, replacement of tea is expensive and, secondly, the production of the old tea areas is needed to supply the factories until such time as new plantings in bearing are sufficient to allow a general replacement programme. It is interesting to note that the Local Jat (a low jat tea of the China hybrid variety) is capable of comparatively high yields—a field of Selected Local Jat at the Experimental Station gave 934 lbs. of made tea per acre in its second season of bearing.

59. The question of yield is of the utmost importance if an export industry on any scale is to be developed. The cost of labour in Mauritius is considerably higher than that obtaining in the main tea-exporting countries (for instance, wage-rates are between two and three times those of tea-gardens in Southern India) and, if Mauritius tea is to be sold at a profit on the export market, it will only be by virtue of efficient production and high yield.

60. The Tea Experimental Station at Wooton now comprises 34·24 acres of bearing tea, 24·5 acres not yet in bearing and a further 3·83 acres in course of preparation for planting. Varieties cultivated are Local, Local Selected, Malayan and Nyasaland jats (the two latter being Assam type high jats). Green leaf harvested was 95,389 lbs. As previously, the Station was used to obtain information on methods of establishment and cultivation, the use of leguminous covers and shade trees, fertilizer practice, varietal differences, etc., and for demonstration and instructional purposes. During the year, an Overseer's house and four labourers' quarters were erected.

61. The Government Tea Plantation at Midlands was originally conceived as a project to plant about 500 acres of tea to supply a Government tea factory to be erected at Wooton or Midlands. The object was to provide a practical demonstration of the possibilities for a modern tea industry in Mauritius, and hence give incentive and a lead to private enterprise. This need has now largely disappeared due to progress in the industry, and, in fact, one of the larger and more progressive tea estates is already performing the function intended for the proposed Government Tea Plantation and Factory. Under the circumstances, the future of the Midlands Scheme is under review. The first 20 acres planted in 1952 were extended to 65 in 1953 and 118 in 1954. Of the present acreage, 15 acres are in bearing and 103 are of non-bearing age. A further 60 acres have been prepared for planting in 1955. It is expected that a total of some 240 acres will be under tea by the end of next year. The three-year old field of Nyasaland jat which came into bearing during the latter part of the year yielded 7,560 lbs of green leaf. Plantings

at Midlands are all of the Nyasaland or Malayan Assam-type high jats. During the year eight labourers' quarters and an Overseer's house were completed under the 1953–54 Estimates, and preparations made for erection in 1954-55 of a further twenty labourers' quarters, another Overseer's house and conversion of an existing building to house the Plantation Superintendent.

62. Provision of adequate supplies of seed is likely to be a problem if appreciable development of the tea industry takes place. The Department has 9 acres of Malayan jat seed-bearers at Parc-aux-Cerfs and another 3 acres of Nyasaland jat at Midlands, which is not yet in production. The former plot yielded 6,650 lbs of seed, of which 4,190 lbs were sold to planters. This production was inadequate, and a further 1,000 lbs had to be imported by air from Nyasaland. Imported seed is both expensive and difficult to obtain —East African suppliers are heavily booked, and it has not been thought advisable to import from Asia due to the danger of introducing Blister Blight disease. Moreover, the Departmental seed-bearer plots are now in the vicinity of commercial plantings, and hence in danger of cross-fertilization Further establishment of seed-bearers in areas remote from tea plantations is therefore, being planned. A gift of a small quantity of seed of a special Assam-jat was received from the Lujeri Estate in Nyasaland and used to establish a new 1 acre seed-bearer plot on the Agricultural Station at Curepipe.

63. The Tea Committee held nine meetings during the year and dealt with a variety of subjects affecting the industry, particularly matters concerning tea exports and local marketing.

64. During the year it has become apparent that Mauritius tea is acceptable to the London market and that the wet highlands are capable of producing high yields of tea of a satisfactory quality. It is in this area that the only appreciable remaining amounts of unutilized land in Mauritius lie, and, hence, unless world tea prices become stabilized at an unecomic level, which is thought unlikely, development of the tea industry to provide substantial exports would seem to offer one of the best method of strengthening the economy of the Colony, now wholly dependent upon sugar. Development on any scale will involve heavy capital expenditure, since tea is an expensive crop to establish and, in order to attract labour, it will be necessary to provide housing, roads and water in the areas proposed for tea. Already labour is a limiting factor, and the costs of existing estates are being raised by the necessity of providing transport between centres of population and the tea areas, due to lack of adequate housing facilities in the latter. Recommendations as to measures of Government assistance for accelerated development of the tea industry are due for early consideration by the Tea Committee in 1955.

Tobacco

65. The industry is under the general control of the Tobacco Board, which allocates planting quotas and purchases, grades, bales and sells the whole of the crop. Planting allocations are based mainly on the estimated requirements for local leaf of the sole manufacturer, the British-American Tobacco Co. (Mauritius) Ltd. The manufacturer also uses imported leaf, in varying proportions according to the different brands of cigarettes produced.

66. Permits were issued for 652 arpents in Mauritius, estimated to produce 395,000 kilos of leaf tobacco. In addition, an export quota of 2,600 kilos of Air-cured tobacco was given to the dependency of Rodrigues. Thus a total production of 397,600 kilos (compared with 565,000 in 1953) was approved by the Board. Of the acreage allocated, only 639 arpents were

actually planted; but, due to higher yields than expected, production was 471,282 kilos—73,682 kilos in excess of the quantity approved. The crop was made up of 296,901 kilos of flue-cured tobacco and 174,381 kilos of air-cured. The acreage planted consisted of 197 arpents of Flue-cured Amarello, 270 arpents of Flue-cured Virginian, and 172 arpents of Air-cured Amarello.

67. For the calendar year 1954, the manufacturer used 386,119 kilos of local leaf and 144,170 kilos of imported leaf, making a total of 530,289 kilos, as against 542,571 kilos in 1953. Imported leaf used in manufacture, expressed as a percentage of domestic leaf, was 37·3 per cent in 1954 as compared with 38·8 per cent in 1953. This figure has risen from 22 per cent in 1950, having been about 7 per cent in the pre-war period. Doubtless this trend is connected with the manufacturer's need to meet increasing competition from relatively cheap imported cigarettes.

68. All sales were to the manufacturer except for 6,831 kilos of Air-cured Amarello exported to London and 237 kilos sold to the Health Department for the inmates of the Mental Hospital.

69. The average yield per arpent obtained by growers were 373 kilos of Flue-cured Virginian, 995 kilos of Flue-cured Amarello and 1,006 kilos of Air-cured Amarello. The average financial returns per arpent were Rs 1,601 for Flue-cured Virginian, Rs 2,145 for Air-cured Amarello and Rs 4,047 for Flue-cured Amarello. Average price per kilo of leaf was Rs 2.13 for Air-cured Amarello, Rs 4.07 for Flue-cured Amarello and Rs 4.29 for Flue-cured Virginian.

70. The 1955 crop is to be restricted to about 302,000 kilos from Mauritius and 1,550 kilos from Rodrigues. The reason for the reduction is accumulation of manufacturer's stocks.

71. The Tobacco Board expects to transfer its operations to the new Tobacco Warehouse at Plaines Lauzun in time for the 1955 crop.

72. The Tobacco Experiment Station continued work at Barkly, Richelieu and Pamplemousses on nursery practice, use of soil blocks, varietal and fertilizer trials, disease problems, curing technique and production of seed for planters. One of the main objectives is the production of Virginian varieties with improved yield capacity and resistance to Black Shank disease. The varieties, Yellow Special and Delcrest offer promise in this respect.

73. Expansion of the tobacco industry is under examination by the Department of Agriculture and the Tobacco Board. The local market offers considerable scope both for replacement of imported leaf used by the manufacturer and for substitution of local for imported manufactured tobacco. In the first regard, it may be noted that 144,170 kilos of imported leaf were used by the manufacturer in 1954, and, in the second regard, that 53,043 kilos of manufactured tobacco (mainly cigarettes) were imported during the same period at a total c.i.f. value of nearly 1 million Rupees. Both an increased share of the local market and a possible export outlet are largely dependent upon improved quality. Amarello tobacco yields heavily and has high resistance to Black Shank disease. Although Amarello will probably always be required to meet the taste of part of the local market, it is only the new Virginian varieties that are likely to replace imported leaf and find an export sale. It is for this reason that the proportion of Virginian to total acreage this year was higher than ever before, and it is encouraging to note that planters are co-operating in the attempt to expand the market through production of new Virginian varieties, even though these, at present prices and yield-levels, do not give the same financial return as Amarello.

Food Crops

74. The Food Production Board went out of existence as from the end of June. Its extension service was absorbed by the Agricultural Division of the Department and the equipment of its mechanised unit was placed under the control of the Sugar Planters Mechanical Pool. Arrangements have, however, been made whereby the equipment is made available to the Department for preparation of land for food crop production.

75. The table below gives the effective acreage and total production of food-crops in recent years as reported by the Food Production Board :—

	Acres	*Metric tons*
1948–49	18,018	19,673
1949–50	13,707	15,558
1950–51	9,208	14,469
1951–52	9,325	15,075
1952–53	8,691	17,371
1953–54	7,700	13,588

Maize and Irish Potatoes comprised the larger part of the acreage grown ; but there were also appreciable areas of Cassava (manioc), Taro (arouille), Sweet Potatoes and Groundnuts, together with a small acreage of Rice.

76. The decline in food-crop production is due to a combination of factors, of which the main ones are the diversion of increasing amounts of land to sugarcane, the easing situation in regard to supplies of imported foodstuffs, particularly rice, and the incidence of praedial larceny. Maize production has also been affected to some extent by Rust Disease, which made its first appearance in Mauritius in 1953.

77. Vegetable-growing is developing satisfactorily and intensive market-garden areas have been established near centres of population, notably in the Vacoas area. The Department's seed-production activities have assisted considerably, and it may be noted that nearly 2,000 kilos of improved vegetable seed was made available to growers during 1954. This aspect of the Department's work is to be expanded in 1955.

78. Some of the more important lines of investigation with food-crops being pursued on the Experimental Stations are studies of the cultivation requirements of potatoes and the production of maize varieties resistant to Rust.

Livestock

79. The Animal Husbandry Extension Service now covers the whole island and is being used by stock-owners to an ever-increasing extent. The number of artificial inseminations of dairy cattle carried out during the year was over 7,000—as against 5,000 last year and under 2,000 the year before. More than 15,000 calls for veterinary treatment were attended to, as compared with about 12,000 in 1953 and 7,000 in 1952. Ovarian cysts remain the chief cause of sterility in peasant-owned milk cattle and enucleations, carried out by officers of the extension service, have contributed appreciably to raising the general fertility. Many cases of calcium and Vitamin D deficiency were also successfully treated. The rapid rise in popularity of the Extension Service was rather more than had been anticipated with some consequent stress on the resources of the Division.

80. The Veterinary Service continued the tuberculin-testing of both dairy and herd cattle. Due to the willing co-operation of owners in elimination of reactors, the incidence of tuberculosis in cattle has been greatly diminished and it appears likely that, within a few years, the occurrence of the disease can be reduced to negligible proportions.

81. Heavy losses of poultry occurred during the year due to Newcastle Disease, which made its appearance in the Black River district and spread rapidly throughout the island. Control was, however, quickly effected by a vaccination programme, using vaccine prepared at the Institut Pasteur in Madagascar. Arrangements are in hand to produce the necessary vaccine locally. The Veterinary Service also offers a very effective vaccination service against Fowl Pox.

82. The Veterinary Officers continued routine inspections of slaughter-houses, exercised control over slaughter of animals of the milk breed and provided instruction in meat inspection to the Sanitary Inspectors of the Health Department. These officers were also responsible for the supervision of the Quarantine Kennels and enforcement of the Animal Diseases Ordinance.

83. Little progress was made in the attempt to popularize the feeding of concentrates to dairy cattle. Only some 41 tons of the dairy-feed prepared by the Department was purchased by cow-keepers from village shops during the year. Price appears to be the limiting factor, and it is hoped to market a cheaper material next year. Distribution difficulties are, however, envisaged in that mixture, which is of the nature of a molascuit, is subject to a loss of weight and change of appearance on storage, and is hence likely to be unacceptable to shop-keepers.

84. Livestock competitions, organised by the Animal Husbandry Extension Service on a district basis, were very popular. These were judged in the field over a period, and are designed to encourage both better types of livestock and improved methods of management. Prizes awarded took the form of surplus animals from the Palmar Breeding Centre.

85. The main functions of the Palmar Breeding Centre are to build up, by selection, a foundation herd of Creole cattle and to produce progeny-tested creole bulls for use in artificial insemination of the general Creole cattle population, As explained in the Chapter on Policy, the Creole animal is well adapted to local conditions and offers prospects of being improved by selective breeding so as to form a valuable breed of milk cattle for the tropics. Whether or not expert opinion will favour the introduction of a proportion of exotic blood in the cooler highlands, all the indications are that the Creole is far more at ease in the warm coastal areas than the grade Friesian. The Creole herd at Palmar was increased by purchase and now stands at 43 cows and heifers, 4 mature bulls, and 4 bulls not yet of serving age. In connection with the Palmar herd, a survey of milk-yield in peasant-owned Creole cattle was conducted throughout the island with the object of ascertaining the most suitable cows for insemination by selected Creole bulls with the ultimate object of purchasing the off-spring for the herd. At the end of the year, the building programme at Palmar was suspended for administrative reasons. During the coming year it will be necessary to complete the surrounds of the three new byres and effect considerable repairs to the old buildings. Small numbers of Ongole and Afrikander cattle Dorsian and local sheep, and Anglo-Nubian goats were also maintained at Palmar.

86. The Government Dairy at Curepipe, composed mainly of grade Friesians, produced 21,435 gallons of milk for the year as against 27,188 in 1953. Yield per cow was about the same as last year, the drop in total production being due to a lesser number of animals in milk. The cause of the decline in calving-rate has not yet been ascertained. The milk was disposed of to hospitals and welfare institutions. The buildings and fittings are obsolescent and general renovation is planned in 1955. As in the two previous years, there was no recurrence of contagious abortion and the use of S. 19 vaccine was continued as a method of control.

Land Settlement

87. The land settlement projects consist of the Pilot Land Settlement Scheme, comprising the Terre Rouge, Petit Sable and Richelieu Settlements, and the Palmar Dairy Small-Holding Scheme.

88. The Pilot Scheme was approved in 1950 with a grant of Rs. 645,000 from Colonial Development and Welfare funds to cover the full estimated cost of establishing settlements on 618 acres over three years. In the following year a supplementary grant of Rs. 30,000 was necessitated because of the increased purchase price of lands at Terre Rouge. During 1954, it became apparent that further capital expenditure of the order of Rs. 406,000 would be required to provide essential works, mainly in regard to irrigation and soil-conservation, that had been omitted from the original estimates. This additional expenditure was authorised in December, being made up of a further Colonial Development and Welfare grant of Rs. 116,105, Rs. 250,932 from local funds, and Rs. 39,095 net revenue from the Scheme. As from July, recurrent costs for personal emoluments and other charges were provided from the Colony's funds. The total cost of the Scheme to completion, exclusive of recurrent charges subsequent to July 1954, is now estimated at Rs. 1,081,132. After completion, which is expected by June 1957, the annual net cost of the Scheme is estimated to be about Rs. 33,500 per annum, being excess of expenditure (interest on capital, administration, maintenance and depreciation) over revenue from rents. Expenditure on the Pilot Scheme from inception to the end of the calendar year 1954 was Rs. 688,935.

89. The Petit Sable Settlement is almost complete, the main capital expenditure still to be incurred being in connection with soil-conservation works and tree-planting on the steeper slopes. During the year, buildings and roads were practically completed, 7 acres were afforested on the steep slopes, and anti-erosion works were carried out in the allotment area. Tenants were given permission to plant up to 75 per cent of their land in canes, instead of the 50 per cent to which they were previously restricted. Satisfactory crops were reaped during the year, particularly of sugar-cane and onions. The Settlement comprises 259 arpents, of which 91 are leased to tenants in the form of 10 equipped holdings, 10 bare-land holdings, 40 allotments and 106 onion-plots. The remaining land, too steep for cultivation, is being planted to trees and to "acacia" (*Leucaena glauca*), the latter to provide fodder for tenants' livestock. Petit Sable is a non-irrigated Settlement.

90. The development of Terre Rouge, the main settlement in the Scheme, is being delayed by lack of irrigation water. Very considerable expenditure still remains to be met for the provision of irrigation works. During the year, the buildings on the equipped holdings as well as 10,000 feet of road were completed. Tenants' crops were generally poor due to lack of water. The settlement comprises 266 arpents, of which 262 are leased to tenants as 20 equipped holdings and 83 bare-land holdings. The small difference is accounted for by land too rocky to be cultivable.

91. The small irrigated settlement on Crown Lands at Richelieu is progressing satisfactorily. Both irrigation and domestic water was made available, and the houses on the 10 four-acre equipped holdings were ready for occupation in November. Good potato and cane-crops were realized by tenants. Of the 112 arpents available, 58 are leased to tenants as 10 equipped and 10 bare-land holdings. The remainder consists of black stony soils which are not irrigable.

92. The Palmar Dairy Small-Holding Scheme, initiated last year, was intended to provide 10 twelve-acre holdings, divided into equal areas of pasture, fodder and arable land, and equipped with dwelling-houses and cow-sheds. Expenditure from inception to the end of the calendar year was Rs. 75,820, mainly on buildings and land-clearing. The buildings were completed and available to tenants by December, and a domestic water-supply was provided. Of the 172 arpents allocated to the Scheme, 145 are in use—65 for cultivation and 80 for fodder. The remainder is rough scrub, not yet cleared. At present, only 4 arpents have been released to each of the 10 equipped holdings, and there are 13 bare-land holdings.

Plant Pests and Diseases

93. Chlorotic Streak has, until this year, been regarded as the only disease of sugarcane of any great importance in Mauritius. This virus disease is widespread in the wetter districts : but satisfactory control is being achieved by hot water treatment of cuttings prior to planting. An insect vector is probably concerned in transmission ; but investigations by the Entomologist have, so far, given negative results.

94. Ratoon Stunting Disease, previously suspected to occur, was positively identified this year. There is evidence that this disease is causing appreciable reduction of cane-yields in the super-humid zone. The Sugar Research Institute has commenced investigation of control measures.

95. Fiji Disease, which is of greater potential destructive power than either chlorotic Streak or Ratoon Stunting Disease, was reported from Madagascar during the year. Immediate steps were taken to tighten up the application of plant protection regulations designed to prevent the introduction of diseases from abroad and the Plant Pathologist was despatched to Madagascar to study the situation. It is satisfactory to report that the French authorities have taken early steps to confine the area of infection; but the presence of this devastating disease in a neighbouring island remains a serious threat to the Mauritius sugar industry. The consequences of accidental introduction of Fiji Disease would be most serious in that, not only are the main varieties under cultivation fully susceptible, but the insect vector also exists in relative abundance. In view of the danger from the presence of the potential vector, *Perkinsiella*, the Entomologist has commenced studies on the bionomics of this insect. The Sugar Research Institute is also arranging for the testing of Mauritius cane-varieties in Madagascar as to resistance to Fiji Disease.

96. Other cane diseases of minor importance are Sclerospora Disease and Red Stripe. Sclerospora Disease, first identified in Mauritius last year, was again discovered this year on an estate in the Moka district affecting the variety E 1/37. Red Stripe, or a disease very similar to Red Stripe, was found at the end of the year on canes of two Barbados varieties growing in an isolated area. The disease was apparently transmitted from infected weed-grasses. Red Stripe is not expected to become of any major importance.

97. With regard to insect pests of sugar-cane, trials with Chlordane for the control of White Grub were laid down and work on the biological control of Cane Borers was continued. A number of parasites of the Spotted Borer were introduced from Trinidad and the situation in regard to previous introductions of parasites of the Pink Borer was evaluated. It was found that one parasite, introduced in 1952, is achieving a measure of success in the field with parasitism rates of the order of 12 per cent to 32 per cent at different times of the year.

98. As concerns diseases of crops other than cane, Maize Rust has caused the most concern. However, losess have been less than last year, when the disease first made its appearance. Reduced severity has been largely the result of weather conditions; but earlier planting, as advised by the Department, has helped to mitigate the effects of the disease. A number of introductions have been made to enable breeding-work to be undertaken with the object of producing resistant varieties

99. Work on biological control of insect pests of other crops was continued during the year. One parasite is showing promise in the control of *Etiella*, one of the two major pests of Pigeon Pea; but unfortunately no successful parasite of the other pest, *Maruca*, has yet been found. A parasite of a common Mealybug species is also giving good results.

Fisheries

100. Marine fisheries are the concern of the Fisheries Division of the Department of Agriculture. This Division, which is the responsibility of the Fisheries Officer, deals mainly with the enforcement of the fisheries regulations and conservation measures. A separate Annual Report has been published (No. 15 of 1955). During the year, the Board of Agriculture, Fisheries and Natural Resources set up a Fisheries Advisory Committee as well as an Oyster Culture Committee. The latter has reported, and its recommendations are under consideration by Government.

101. During the year, preliminary steps were taken to initiate investigations into the possibilities of fresh-water fish farming. At the end of march, a small number (29) of *Tilapia malanopleura*, introduced from Tanganyika were liberated in a Forest Department dam at Belle Rive in the wet highlands. These fish have now produced a numerous first generation. Arrangements are in hand by the Forest Department to construct four additional ponds in 1955 at Five Ways, adjacent to Belle Rive, for the purpose of receiving fish from the Belle Rive dam. It is also proposed to provide fish ponds at the Curepipe and Richelieu Agricultural Experiment Stations in the high and low zones respectively, for the purpose of receiving further introductions and for the purpose of conducting experiments on the integration of fish-farming into current agricultural system. Arrangements are in hand for introductions of *T. nilotica* and *T. macrochir* from Tanganyika and of *T. zilii* and *T nigra* from Madagascar. Responsibility for further work on fresh-water fish farming is to be assumed by the Agricultural Division as from July, 1955. The co-operation and interest of the Conservator of Forests in the initial phase has been a great value.

Rodrigues

102. Little change can be recorded in the general agricultural situation in this precipitous, eroded and densely populated little island.

103. Subsistance agriculture is practised on small-holdings in the hilly interior lands. The season has been moderately favourable, and satisfactory crops of the main staples. (maize, manioc, sweet potatoes and beans) have been obtained. The pressure on land has been further increased by the return on demobilization of men of the Royal Pioneer Corps. Matters concerning the lease of Crown Lands have, therefore, taken up a great deal of the time of the Agricultural Officer and his assistant. Work on the construction of stone walls along the contour on Crown Lands was continued, and, by the end of the year, nearly 1,000 acres had been so treated since these works were commenced some years ago. Unfortunately, these measures have been costly and not entirely effective. A great deal of similar construction, carried out by farmers on their own initiative, has, through faulty siting, in most cases aggravated rather than relieved erosion. Soil and water conservation remain the most urgent problems in the Dependency, and there is also great need for the introduction of new crops, improved varieties of existing crops, and the development of a rational system of rotational cropping.

104. The coastal areas largely comprise the "Cattle Walk," where stock-raising is practised on unimproved natural grassland with marginal rainfall and, in the main, poor soils. The annual census of livestock showed that numbers of cattle and pigs had been maintained ; but that there was a decrease in both sheep and goats, especially the former.

105. The Chemical Division completed the analyses of Rodrigues agricultural soils. These show that the soils are, in general, clay loams of satisfactory reaction and potash-content, but deficient in nitrogen, organic matter and phosphate.

106. At the end of the year, the Senior Agricultural Officer (Extension) was sent from Mauritius to report on land usage and availability with special reference to the possibilities for absorption of returning Pioneers. This will probably involve considerations of rehabilitation of eroded land and of possible diversion of the more fertile portions of the Cattle Walk from extensive pastoral use to more intensive arable production.

Boards and Committees

107. During the year, the Director of Agriculture served on the following :—

Board of Agriculture, Fisheries and Natural Resources :

Executive Committee of the above.

Cane Release Committee of the above.

Agricultural College Advisory Board.

Board of Examiners of the above.

Board of Examiners for the Registration of Agricultural Chemists.

Comité de Collaboration Agricole Maurice-Reunion.

Customs Tariff Advisory Board.

Cyclone and Drought Insurance Board.
Land Acquisition Board.
Malaria Advisory Board.
Mauritius Sugar Industry Research Institute Board.
Research Advisory Committee of the above.
Sugar Industry Reserve Fund Committee.
Tea Committee.
Tobacco Board.

108. The Department was also represented by other officers on the following :—

Fisheries Advisory Committee of the Board of Agriculture.
Irrigation Committee of the Board of Agriculture.
Land Settlement Committee of the Board of Agriculture.
Sack Factory Board.
Sugar Industry Rehabilitation Fund Committee.
Sugar Millers Rehabilitation Fund Committee.
Sugar Planters Rehabilitation Fund Committee.

in addition to various *ad hoc* Committees.

M. N. LUCIE-SMITH,
4th November, 1955. *Director of Agriculture.*

Staff of the Department of Agriculture

The Senior posts of the Department are as follows :—

Director
Deputy Directors (2)
Senior Agricultural Officers (4 posts)*
Chemist, Agricultural Chemistry Division
Plant Pathologist
Principal and Lecturer in Chemistry
Registrar, Central Board
Accountant, Central Board
Chief Chemist and Registrar, Central Board
Sugar Technologist and Officer in charge of the Engineering Division
Chemical Engineer
Entomologist
Associate entomologist
Senior Veterinary Officer
Veterinary Officer
Animal Husbandry Officer
Fisheries Officer
Tea Officer†

There are 25 officers who are Assistant Head of Divisions or of similar grade (including agricultural officers) 47 officers of the grade Scientific Assistant or its equivalent (including Agricultural Instructors), 34 Overseers or Officers of similar grade, 26 members of the Clerical Staff and 26 Laboratory Attendants and Messengers.

In the Fisheries Branch there are seven Inspectors of three grades and 52 Guards of two grades. The staff of the College of Agriculture consists of a Principal and Lecturer in Chemistry, three Lecturers and three Assistant Lecturers.

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* Two posts under Development Establishment vacant.
† Included in Development Establishment.

Staff Movement

Mr. W. Allan, C.B.E., Director of Agriculture, left the Colony on 11th April, 1954, on leave prior to transfer as Director of Agriculture, Cyprus.

Mr. M. N. Lucie-Smith was appointed Director of Agriculture on 20th November 1954 and assumed duty on the 23rd November, 1954.

During the period 12th April to 22nd November, 1954 Mr. A. N. Coombes, Deputy Director of Agriculture, acted as Director of Agriculture.

Mr. R. Avice, Registrar Central Board, was promoted to the 2nd post of Deputy Director of Agriculture with effect from 25th January, 1954.

Mr. C. Mayer, Assistant Registrar Central Board, was seconded for duty as Mechanical Engineer Public Works Department as from the 15th June, 1954 and finally appointed to that post with effect from 12th December, 1954.

As from the date of Mr. Mayer's secondment Mr. Avice supervised the work of the Central Board whereas Mr. J. Dupont de Rivalz de Saint Antoine Lecturer in Sugar Technology, Mauritius College of Agriculture acted as, Assistant Registrar. Mr. A. E. Rouillard was appointed Lecturer in Sugar Technology in the room of Mr. Dupont as from 1st September, 1954.

Mr. A. d'Emmerez de Charmoy, Land Utilization Officer, Development Establishment, was promoted to one of the permanent posts of Senior Agricultural Officer with effect from 2nd December, 1954.

Mr. A. Moutia. Associate Entomologist, returned from overseas leave on the 14th May, 1954.

Mr. J. de B. Baissac, Fisheries Officer left on European leave on the 17th April 1954 and returned on the 20th September, 1954.

Central Board Division

Composition of the Board for the year 1954

Chairman.—E. Hugues, Esqre.

Millers' representatives :—

E. Julienne, Esqre.
F. North Coombes, Esqre.

Big Planters' Representatives :—

G. Rey, Esqre.
Hon. A. M. Osman, O. B. E.

Small Planters' Representatives :—

M. Burrenchobay, Esqre., M. B. E.
R. Deelchand, Esqre.

Mr. Cyril Mayer, Chief Chemist and Assistant Registrar, Central Board, was transferred to the Public Works Department in June 1954. Mr. Jacques Dupont de Rivalz de Saint Antoine, Lecturer at the College of Agriculture, was seconded for duty to the post of Chief Chemist and Assistant Registrar. Mr. Dennis Adam Rock was appointed Weighbridge Inspector and Investigational Officer as from the 3rd May, 1954.

Meetings

The Board held 65 Meetings during the year :—

2	meetings	relative to application of change of delimitation
3	do.	assessment of sugar to planters
41	do.	protests against assessment of sugar
14	do.	general business
2	do.	Report of Committee of Accountants
1	do.	Report of Mr. R. Avice on his mission to South Africa
2	do.	Cane Testing.

Many cases of protest against the assessment of sugar made by the Central Board to planters were still pending due to the delay sustained before a decision could be taken in the case of Seeralall Jhuggroo in Her Majesty's Privy Council. The Board have had consequently to meet more often to deal with these pending cases.

An appeal against the decision of the Board concerning a case of protest by a miller against the 1952 assessment to its planters remains still to be heard. Besides, the hearing of this case of appeal, there is also a case of protest against 1953 assessment by the same miller. Thus the year 1954 has been a very busy one for the members of the Board as well as for its staff.

Registration of Cane Contracts

10,182 Cane Contracts were registered. The total number of contracts in force for the 1954 crop was 15,497 of which 14,562 referring to 20,918 planters were on a provisional basis. The total number of planters was 21,853.

Some planters enter into contracts with two different Middlemen for the sale of their canes thus committing a Breach of Cane Contract. Legal action has been taken against a number of such planters during the year.

Permits to Middlemen

Fifty-four permits were granted to Middlemen as compared with fifty-one in 1953.

Middlemen supplied tonnages of canes of varying between 1,000 to 20,000 tons.

The Board had to deal with cases of two Middlemen concerning the settlement of their planters for the previous crops.

In the case of one Middleman, the desirability of the Board to renew his permit will have to be considered.

Delimitation of Factory Areas

Eight applications for changes of delimitation of Factory Areas were received by the Board. In four cases the requests were granted.

Control of Cane Weighbridges

A total of 160 weighbridges dealing with planters' canes were tested during the year. On first inspection 142 were found accurate and 18 had to be re-examined. Of these 18, two had to be re-examined a third time, None were condemned.

Two old weighbridges were replaced by new ones for 1954 crop.

Surprise checks carried out at weighbridges

329 surprise checks were carried out and 257 vehicles were re-weighed. In only one case the weight was found inaccurate, the weigher was prosecuted.

Cane Testing

8,764 sucrose content tests were carried out on 196 individual or group of planters supplying canes to twenty-five factories. Last year's figures were 8,960 and 192 respectively. The lesser number of tests performed this year is mainly due to the shorter duration of the crop. In addition to the permanent staff of the Central Board, 18 Cane Testers were employed.

1952 Crop Costs of Production Estates with Mills

After the initial delays had been overcome, the first comprehensive analysis of average costs of production, compiled from the detailed information submitted by all 27 of the Estates with Mills, was placed before the Board, together with a Report on the work and recommendations.

1953 Crop Costs of Production—Estates with Mills

As a result of co-operation between the Accountant of the Board and the Chamber of Agriculture, it was possible to agree upon a joint printed Cost Questionnaire for completion by each of the 27 Estates with Mills. Very little delay was experienced in spite of the considerable detail called for, and all the Board's completed copies had been received back by the end of the year. For the first time it will be possible, early in 1955, to place before the Board a two-year comparison of costs, as well as a series of average costs of production, for all the Estates with Mills.

1953 Crop Costs of Production—Planters

Early in April 1954, 150 planters (double the number for the 1952 crop) selected according to size and location, were requested to complete a standardised questionnaire. Completed questionnaires had been received back from 120 of these by the end of the year. Of these, as large a selection as possible was subjected to personal verification by either the Accountant or his Assistant, books of account and record being inspected.

Every effort was made to encourage the Federation of Co-operative Societies to submit representative costs of production for their small planters, who, by number, speak for a fairly large proportion of planters as a whole, but to date, nothing has been received from that source. Early in 1955 comparative planter costs of cane production analysed according to size of holding and location will be placed before the Board.

Protests against the Board's Assessment of sugar

From Millers

Four major cases of protest from millers were decided by the Board during the year. A thorough investigation into the figures submitted was carried out and much additional information was placed before the Board. The average costs of production previously referred to enabled the Board to make cogent comparisons. Many points of principle were also brought to their notice. So far as possible, relevant factors were reduced to cents per ton of cane, to facilitate judgment.

Five major cases of protest for the 1952 crop have been withdrawn, there were no protests from millers on financial grounds for the 1953 crop.

From Planters

No planter case of protest was sustained on financial grounds.

Prospect

The programme of work for 1955 (1954 crop) will follow the lines established in 1954, and the lessons learned from the experience of the previous year will be applied so far as is possible with the limited staff available.

J. Dupont de Rivalz de Saint Antoine,
Acting Assistant Registrar, Central Board.

Agricultural Division

1. Staff

Since the beginning of the year the Deputy Director, in charge of the Division, Mr. G. A. North Coombes, continued to be engaged mostly on administrative duties and on 12th April was appointed acting Director of Agriculture. He returned to the division in December. During his acting-ship, the Senior Agricultural Officer, Mr. R. Antoine, was in charge of the Division. Mr. E. Lesur, Agricultural Officer, proceeded on three months vacation leave prior to retirement on 28 June, but was re-employed in September on a temporary basis to take charge of the hay-making scheme which was taken over from the Livestock Division. Mr. S. Bagwant, Agricultural Instructor, left Rodrigues on 19th February, on leave, and returned on 18th April. Mr. J. Abraham, Overseer at Rodrigues, spent his leave in Mauritius from 11th September to 29th November. Mr. L. Moorlee, Agricultural Officer, left Rodrigues on transfer on 30th November. Mr. S. Bagwant was in charge of the Station in the dependency, until the arrival of Mr. C. M. Courtois, the newly appointed Agricultural Officer, on 7th December. Mr. E. Farla, Agricultural Instructor, was posted to Rodrigues and sailed on 4th December to relieve Mr. S. Bagwant who will return to Mauritius next year on completion of his tour of duty. Mr. F. Monneron Overseer Grade I, was transferred from Curepipe Experiment Station, to Pamplemousses Experiment Station, on 7th January, to replace M. M. Fakim who was posted to Curepipe Experiment Station.

On 1st July, the Extension Service of the Food Production Scheme was absorbed by the Agricultural Division. The Mechanical Unit, however, is now controlled by the Sugar Planters' Mechanical Pool. Mr. A. d'Emmerez de Charmoy, M.B.E., who had been in charge of the Food Production Scheme, returned to the Division as Land Uutilization Officer. He was promoted Senior Agricultural Officer, in charge of the Extension Service, on 2nd December and went on mission to Rodrigues on the 3rd.

2. Experiment Stations

(*a*) *Barkly Experiment Station.*—Beau Bassin—(Altitude : 750 feet ; average rainfall : 45 ins.). The number of visitors to the horticultural station continued to increase and sale figures of seed and other planting material were the highest on record.

A new technique of seed sowing and plant potting was experimented with, using John Innes Compost. This proved to be a great improvement on the older methods. A goradam soil block-making machine was acquired and gave good results in the preparation of blocks. John Innes formulæ had to be slighty modified.

An area of 6 acres, added recently to the station was partly cleared for growing vegetables for seed production. Roads were built, a reservoir of 15,000 cubic feet capacity was constructed and piping was laid to connect this reservoir to the irrigation system of the older section.

The potting shed and the watchman's hut mentioned in the previous report were completed. Fencing of the station was continued.

(*b*) *Central Experiment Station*, Reduit.—(Altitude : 1,040 feet ; average rainfall : 63·5 ins.).

Part of the station was planted with various vegetables for seed production, and part with foodcrops, including a potato spacing-fertilizer experiment. There were also a number of plots under citrus, banana, pineapple, coffee for experimental purposes or for production of planting material. Small plots were planted with various fodder species.

Experiments were started on breeding for resistance to the new maize rust disease.

The construction of a new building to serve as a store, an overseer's office and a carpenter's workshop is being erected ; fencing the station with barbed wire, construction of irrigation canals, laying of asbestos piping for irrigation purposes were continued.

(*c*) *Curepipe Experiment Station.*—Altitude : 1,830 feet ; average rainfall : 125 ins.)

The newly opened lands were planted mainly with fodder crops and foodcrops. A potato spacing and fertilizer trial gave particularly interesting results as regards the possibility of raising high crops of potatoes with adequate fertiliser applications, late in the year. An experiment on the storage of seed potatoes is in progress.

Small plots were planted, at intervals throughout the year with vegetables, in order to study the possibilities of vegetable growing in the humid zone.

Construction of roads on the station were continued. Piping was installed to supply water to the vegetable section. The quarters for watchmen were completed and fencing of the experimental plots continued.

(*d*) *Pamplemousses Experiment Station.*—(Altitude : 180 feet ; average rainfall : 50·5 ins.).

More land was reverted from sugarcane to foodcrops and vegetables this year—potato and groundnut field experiments were planted on a fairly large scale and were followed by vegetables for seed production. A three-acre field was planted with various varieties of tobacco including a number of newly introduced varieties. A fodder variety and fertilizer experiment was established. Experimentation on the control of weeds in maize plantations by herbicides was carried out.

(*e*) *Plaisance Experiment Station.*—(Altitude : 180 feet ; average rainfall : 62·8 ins.

This station on which experiments in haymaking were started a few years ago was taken over from the Livestock Division in the middle of the year. The various plots of fodder grasses were successfully freed from weeds by spraying with selective weedkillers. An additional 16 acres were prepared for planting various fodder grasses and "acacia". The ploughing of this area required the use of a heavy tractor owing to the gravelly nature of the soil. The heaps of bulldozed stones and earth between fields were cleared of weeds and bushes prior to sowing with "leucaena".

The Curran drier— a plant in which artificial heat is used for making hay—was experimented with. Hay of chopped cane tops, and of various grasses was turned out satisfactorily.

(*f*) *Richelieu Experiment Station.* (altitude : 200 feet ; average rainfall : 32 inches).

Work on tobacco, foodcrops, fibre and fodder crops was continued during the year. The production of vegetable seed at Richelieu was started with very promising results. The work on fodder and food crops was extended considerably and included a number of field experiments on acacia, maize, groundnuts and potatoes.

The construction of a mechanical workshop was completed—the workshop was equipped with tools including acetylene and electric welding equipment. Light and medium tractors, mechanical equipment, a lorry and a van were taken over from the Food Production Scheme.

The bulldozing and ripping of fields with the heavy implements of the Sugar planters Mechanical Pool were continued. A number of field operations such as ploughing, harrowing, furrowing, hilling, and spraying are now done with mechanical implements. Plans are well advanced for the further mechanisation of the station.

A reservoir of about 150,000 cubic feet capacity with improved concrete sides was constructed at the station. The net-work of main irrigation canals was extended and additional piping for the sprinkler was acquired.

Two overseer's quarters and a watchman's quarters were completed during the year ; the construction of another overseer's quarters and of huts for labourers was started. New roads are being opened and old roads improved.

3. Gardens and Nurseries

At Telfair Gardens, a favourite resort for pic-nics in the South of the Island, a metalled road was constructed.

The flow of visitors to the Royal Botanical Gardens continued. As usual, a number of functions were held there by Public bodies. Improvements to the Gardens included repairs to roads and kiosks. Some exotic species introduced in recent years are making fair progress and will add to the beauty of the gardens.

A number of improvements were also made to the nurseries of Barkly, Abercrombie and Pamplemousses : old sheds were modified and repaired or replaced by new ones. A new technique of mango grafting is being experimented with and has already given very promising results.

4. Plant Propagation

Useful plants have been propagated as in the past at Pamplemousses and Barkly Experiment stations. The following figures give the number of the more important fruit trees propagated during the year for sale to the public :—

Avocado (grafts)	432
Avocado (seedlings)	403
Bread fruit	455
Coconut—Ceylon	244
Coconut—Pemba	503
Litchi (layers)	1,600
Mango	490
Loquat (grafts)	520
Citrus (seedlings all varieties) ...	4,978

The following method of mango propagation gave promising results, Mango stocks 2 years old, growing in the open were cut back to a height of six inches. These were crown grafted. Wood a year old but still green in colour was used as scion. The part grafted as well as the scions were painted with molten paraffin wax. Wrapping paper was cut into rectangular pieces 10" x 12," they were made into small funnels and these were fixed to the stocks 4" above the level of the soil. The funnels were filled with moist coarse coral sand. Every morning about twenty five cubic centimetres of water were poured on the sand.

During the past ten years trials on vegetative propagation of the Pecan nut could not be carried out as no stocks could be raised, on account of the poor germination of pecan seeds under local conditions. In July about a month after harvest, dry pecan nut seeds were divided into two lots and placed in linen bags. The first batch was put in a refrigerator, while the second one was stored in a sealed container kept at room temperature. In November, at the time when the pecan nut trees were starting to sprout, the seeds were sown separately on a bed in the open. By the end of December a very high percentage of the seeds which had been kept in cold storage had germinated whereas seeds stored at room temperature decayed.

Raising of sugarcane seedlings in John Innes compost

The object of the experiment was to compare the soil-manure : mixture normally used for raising sugarcane seedlings with John Innes' seed and pottings composts (modified formulæ). In addition, investigations were carried out to determine seedling stand when using two sizes of flats. Incidence of damping off disease was also assessed.

The trials were carried out in co-operation with the Mauritius Sugar Industry Research Institute. The John Innes' compost had to be modified as some of the ingredients in the original formulæ are not available locally. These differences are shown below :—

ORIGINAL JOHN INNES	MODIFIED "SEED" COMPOST
Seed Compost—Parts by Volume	
2 turfy loam	2 top soil
1 granular peat	1 granular material obtained by sieving decaying wood through ⅜" sieve
1 sand	1 coral sand
2 lbs superphosphate	2 lbs superphosphate per cubic yard
1 lb chalk	

ORIGINAL JOHN INNES	MODIFIED "POTTING" COMPOST
Potting Compost—Parts by Volume	
7 loam	7 top soil
3 granular peat	3 granular material (as mixed compost)
2 sand	2 coral sand
5 lbs J.I. base (per cu. yard)	3 lbs J.I. base (less hoof and horn)
1 lb chalk (per cu. yard)	

The top soil for both the seed and potting composts was steam sterilized at 93° C. for 5 minutes at low pressure.

The ordinary compost used as control consisted of :

Top soil—2 parts,
Farmyard manure,—1 part

This mixture was steam sterilized at 93° C. at low pressure for about four hours.

Equal parts by weight of fuzz were planted in :—

EXPERIMENT NUMBER

I ... Usual seedling flats 19¾″ × 13½ × 4 ⅜″ containing soil manure mixture
II ... Usual seedling flats 19¾″ × 13½ × 4 ⅜″ containing modified J.I. seed compost
III ... Usual seedling flats 19¾ × 13½″ × 4 ⅜″ containing modified J.I.P. 2 potting compost
IV ... Standard British seed box 14″ × 8½″ × 2″ containing modified J.I. seed compost
V ... Standard British seed Box, 14″ × 18½″ × 2″ containing modified J.I.P. 2 potting compost

Fuzz from 14 different crosses were used in the experiment but those from five crosses only gave good germination, the number of seedlings obtained being as follows :

Cross No.	*Experiment Number*				
	I	II	III	IV	V
1745	88	72	95	100	46
1747	591	560	600	840	752
1751	44	50	50	20	40
1752	162	168	120	120	124
1753	413	456	497	390	384
TOTAL ...	1,298	1,306	1,362	1,470	1,346

There were apparently no difference in the times for the fuzz to germinate, in the number of seedlings obtained and in the rate of growth of seedlings between the experimental and control flats in spite of the big differerence in size of the seedling flats. A few cases of damping off were noticed in the boxes containing soil-manure mixture, none in those with the modified John Innes composts.

Experiments made to test the best stage for pricking seedlings showed definitely that this operation should be performed as soon as the seedlings can be handled, that is, about 5 days after germination. There is then apparently no set back.

5. Production of vegetable seeds

On the whole the season was very favourable. Dry weather conditions prevailed during the harvesting period.

Plantations were made at the Central, Barkly, Pamplemousses and Richelieu experiment Stations, the bulk being produced at Barkly and Reduit. The results obtained at Richelieu were so promising that it is comtemplated to put a large area under vegetables for seed production next season.

The introduction of seed cleaning machines has reduced hand cleaning of seeds to a minimum, practically all the seed harvest being clean by the middle of December, a gain of several months over cleaning by hand.

Experiments on cold storage of vegetable seeds are being carried out. Seeds of the following varieties of vegetables were imported from England and were grown in observation plots :—

Cabbage	...	Greyhound, January king, Offenham selected
Tomato	...	Two dwarf varieties : Puck and Amateur
Lettuce	...	Trocadero, May King, All the year round and attractie

No serious outbreak of insect pest was detected with the exception of an attack of *Polyomnatus boeticus* on peas at Réduit. The incidence of bacterial wilt was high at Pamplemousses.

For the first time, about one kilo of acclimatised Brunswick cabbage seed has been produced.

Figures showing production of seeds from 1951 to 1954 are given below :—

	kilos
1951	953
1952	1,362
1953	1,467
1954	1,924

6. Experimental Work on Crop Plant

(a) *Potato*

1. Experiments with different rates of fertilizers, at varied seed sett spacing, in different localities, gave generally very encouraging results. High fertilizer levels were experimented with in order to obtain high yields. The effect of farmyard manure as compared to artificial fertilizers was also assessed.

SUMMARY OF EXPERIMENTS

1st Experiment :—

Variety ... King George, certified seed, obtained from South Africa
Spacing ... A—18″×12″, B—18″×15″, C—18″×18″, D—18″×21″, setts planted in holes

Fertilizer treatments	t_1	t_2	t_3	t_4	t_5
FYM (tons/acre)	20	15	10	5	10
Artificial fertilizers (kgms/acre)					
Sulphate of Ammonia	50	102·5	172·5	250	100
Superphosphate	150	190	232·5	250	40
Sulphate of potash	100	207·5	345	500	70
TOTAL ...	300	500	750	1,000	210

Treatment t_5, the one that was usually employed, was included for purposes of comparison.

Design : randomized blocks
Plot size : 1/52 acre
Crop cycle : 3 months

TABLE I

Experimental Results

Experiments	Stations	Date planted	Treatments							G. M.		Spacing						Coef. of variations	No. of replicates
			t_1	t_2	t_3	t_4	t_5	std. error	sig. diff. 5% point		std. error	std. error	A	B	C	D	Sig. diff. 5% point		
I	C.E.S.	14.5.54	9·91	10·10	10·12	10·22	8·10	±0·24	±0·71	9·69	±0·11	±0·22	10·57	10·11	9·32	8·77	±0·65	7·08%	2
II	R.E.S.	10.4.54	10·14	11·38	10·38	10·14	9·76	±0·53	±1·57	10·36	±0·24	±0·48	11·52	10·90	9·81	9·20	±1·40	14· 5%	2
III	R.E.S.	18.6.54	6·76	7·48	7·65	8·92	6·33	±0·45	±1·34	7·43	±0·20	±0·41	7·33	8·77	6·98	6·65	±1·19	17· 0%	2
IV	P.E.S.	20.5 to 29.5.54	7·28	7·13	7·10	6·78	6·59	±0·23	±0·67	6·98	±0·10	±0·21	7·49	7·36	7·17	5·88	±0·61	11· 2%	3
V	P.E.S.	5.6.54	8·84	7·68	8·55	8·54	7·37	±0·94	±2·78	8·20	±0·42	±0·84	8·98	8·58	8·54	6·70	±2·49	32· 5%	2

C.E.S. = Central Experiment Station (Réduit) ; R.E.S. = Richelieu Experiment Station ; P.E.S. = Pamplemousses Experiment Station.

The high coefficient of variation is due to the fact that land on the experiment Stations has been recently bulldozed.

On the whole it appears that with a properly balanced mixture of farmyard manure and artificial fertilizers, yields of 10 tons and over can be obtained as compared to the usual 6 tons.

The second conclusion is that higher yields are obtained when close spacing is adopted.

In the case of Experiment II, blight was successfully controlled by mechanical spraying using a Dorman Sprayer with a 13 inches boom mounted on a 22K Massey Harris tractor.

A second series of experiments was set up using different fertilizer formulae, this time with high levels of phosphate.

The same variety was experimented with. Furthermore, the setts were planted in holes in Experiments VI and VII and in furrows in Experiments VIII to XII. The following spacings were adopted in order to have a slightly denser plant population when planting in furrows.

	In holes	*In furrows*
A	18″ × 12″	24″ × 6″
B	18″ × 15″	24″ × 9″
C	18″ × 18″	24″ × 12″
D	18″ × 21″	24″ × 15″

Fertilizer treatments	t_1	t_2	t_3	t_4	t_5
FYM (tons/Acre)	20 T	15 T	10 T	5 T	10 T
Artificial fertilizers (Kgms/acre) :—					
Sulphate of Ammonia	46	104·5	190	294	100
Superphosphate	216	308	402	461	40
Sulphate of Potash	38	87·5	158	245	70
Plot size : 1/52 Acre					
Crop cycle : 3 months					
TOTAL ...	300	500	750	1,000	210

TABLE II

Experimental Results

Experiments	Stations	Date planted	Treatments							G. M.	std. error	Spacing						Coeff. of variations	No. of replicates
			t_1	t_2	t_3	t_4	t_5	std. error	sig. diff. 5% point			std. error	A	B	C	D	Sig. diff. 5% point		
VI	Cpe E.S.	8.8.54	7·24	8·73	9·22	10·29	6·13	±0·26	±0·77	8·32	±0·12	±0·23	9·21	8·99	7·49	7·60	±0·69	9%	2
VII	B.E.S.	4.9 to 6.9.54	7·96	7·93	7·51	8·62	6·93	±0·91	±2·68	7·79	±0·41	±0·81	8·31	7·61	8·32	6·94	±2·39	32%	2
VIII	R.E.S.	5·8·54	12·04	11·98	12.76	10·97	10·32	±0·60	±1·78	12·09	±0·27	±0·54	13·14	12·28	12·40	10·54	±1·59	14%	2
IX	R.E.S.	23·8·54	7·84	7·18	6·53	9·55	8·74	±0·85	±2·52	7·97	±0·38	±0·76	8·43	8·33	7·28	7·84	±2·25	30%	2
X	R.E.S.	27·8·54	5·51	7·21	7·44	6·99	4·91	±0·54	±1·60	6·41	±0·24	±0·48	7·45	6·35	6·37	5·46	±1·42	16%	2
XI	R.E.S.	28·8·54	6·41	8.57	8·88	8·20	6·65	±0·50	±1·48	7·74	±0·23	±0·45	9·64	7·57	7.40	6·35	±1·33	18%	2
XII	R.E.S.	31·8·54	6·21	7·58	8·88	6·99	4·79	±0·34	±1·00	6·89	±0·15	±0·30	7·74	6·68	6·96	6·19	±0·89	14%	2

Cpe E.S. = Curepipe Experiment Station ; B.E.S. = Barkly Experiment Station ; R.ES. = Richelieu Experiment Station.

Experiment VI was carried out in a high rainfall area in heavily leached soil. The land had been under natural grass vegetation and had only recently been put under cultivation. The highest level of artificial fertilizer gave a significantly higher yield than all other treatments.

Experiment VII was laid out in the newly acquired land at Barkly Experiment Station. In fact, the land had recently been bulldozed and was being put under cultivation for the first time. That accounts for the high coefficient of variation.

It is interesting to compare Experiment VIII with Experiments IX to XII. In all Experiments carried out at Richelieu Experiment Station irrigation was performed by means of the Sigmund Rainer equipment. The pump, however, broke down round about mid-October. All plots in Experiment VIII received sprinkler irrigation for two and a half months and surface irrigation for two weeks ; whereas, all plots in Experiments IX to XII received sprinkler irrigation for one and a half month and surface irrigation for the same length of time. The yields in the former experiment are considerably higher than those in the latter series. It should be mentioned. however, that potato in Experiments IX to XII followed tobacco and the plants were heavily infested with nematodes.

Here again the conclusions are that close spacings whether the setts are planted in holes or furrows, give the higher yields ; and, that with properly balanced fertilizer formulæ at high levels very interesting yields can be obtained. The highest yield for a single plot was 15½ tons per acre.

Blight was successfully controlled in all plots, the incidence of leaf roll was very low and bacterial wilt caused insignificant damage.

2. Variety trials

The results of variety trials carried out at Pamplemousses and Richelieu Experiment Stations are given below. Spacing adopted throughout was 18" x 15". setts planted in holes, and the following fertilizer treatment was given :—

Farm Yard Manure	... ...	15 tons per acre
Sulphate of ammonia	... ...	102·5 kg. ,,
Superphosphate	... ...	190 kg. ,,
Sulphate of potash	... ...	207·5 kg. ,,
Total artificials	... ...	500 kg. ,,

Variety	P.E.S.* *Yield Tons/acre*		R.E.S.† *Yield Tons/acre*	
	Gross	*Nett*	*Gross*	*Nett*
Sebago	7·4	6·7	9·6	8·6
Kennebec	6·9	5·7	7·3	6·2
Pentland Ace	4·1	3·3	4·0	3 9
King George	5·5	4·7	9·5	8·3
Up to date	—	—	10·0	9·5
Australia	—	—	10·8	9·9
Madagascar	9·4	—	—	—
Majestic	7·0	—	—	—
Leslie	6·3	—	—	—
Up to date (from Donnybrook) ...	8·2	—	—	—
Up to date (from Amsterdam) ...	8·0	—	—	—

*P.E.S. Pamplemousses Experiment Station.
†R.E.S. Richelieu Experiment Station.

The variety Sebago, imported from South Africa, planted for the first time in the island, compares favourably with the popular King George variety.

Incidence of leaf roll on varieties Sebago, Kennebec and Pentland Ace was high for certified seed, namely about 7 per cent.

3. Storage Experiments with Seeds Potatoes

(i) *Cold Storage.* Cold storage experiments to find out whether there was any degeneration of the parent stock through virus diseases, were continued. These have been in progress on different varieties, in some cases as far back as 1945. The original seed material, in the trial reported here, comprise several varieties imported from various sources in 1950 and 1951 by the Food Production Board. The seed produced locally from the imported stocks was put in cold storage after each crop, and planted again in the field the following year. Some of the varieties are in their fifth generation, some in their fourth and one variety in its second generation.

So far no decline in yield has been observed. It should be mentioned, however, that this year a high level of fertilizer was employed, in fact the one given in the variety trial and the same spacing 18" × 15" was adopted. Yields have consequently gone up. There does not seem to be degeneration of the parent stock, stored locally, through virus diseases.

RESULTS OF EXPERIMENTS ON COLD STORAGE OF SEED POTATOES

(All yields are in Tons/arpent)

Variety	*Year of importation*	*Yield 1st generation raised from imported seed*	*Yield 2nd generation*	*Yield 3rd generation*	*Yield 4th generation*	*Yield 5th generation*
Arran Banner	1950	9·6	2·8	5·8	5·6	8·8
			3·6	7·0		9·6
Alpha	1950	7·9	4·7	8·8	8·1	9·0
				10·6		8·1
King George	1951	8·5	9·9	6·0	6·0	—
Kerr's Pink ...	1951	4·6	6·8	5·7	7·2	—
Arran Peak	1951	6·5	6·5	5·3	6·0	—
Up-to-date	1951	4·5	9·6	8·6	8·7	—
Up-to-date	1951	5·2	3·0	7·4	9·1	—
Arran Banner	1951	5·0	6·4	7·1	8·0	—
					9·3	—
Majestic	1953	5·2	8·3	—	—	—
Average all varieties ...	—	6·3	6·2	7.2	7.6	8.9

ACTUAL YIELDS DURING THE FIVE YEARS

(Experiments on cold storage of seed potatoes)

	1950	*1951*	*1952*	*1953*	*1954*
Average yields all varieties	8·8	5·0	7·4	6·6	8·2

(*ii*) *Storage at room temperature.*—Two barns at Richelieu were used for storing seed potatoes. The seed was stored, in thin layers, on shelves, made of wire netting fixed to the tier poles. Twelve shelves, of 200 kgs. capacity each, were installed in each barn. In one barn the interior was kept dark and well ventilated. In the second barn the potatoes were treated with Fusarex and the barn kept dark with all openings rightly closed.

At Curepipe, storage is being carried out in trays with bottom made of wire netting, of 35 kg. capacity, stacked one above the other in a dark, well ventilated room.

At both stations the potatoes came from fields that had shown no signs of blight or virus diseases. The seed has been stored for over two months and has kept in perfect condition.

(b) Groundnuts

(i) Spacing/Variety Trial.—The experiment was carried out with nine varieties planted at four spacings, three in holes and one in drills.

Design : Split plot ; 3 replications. Spacing plots split for varieties. Each subplot measured 5′ × 40′. Preceding Crop : tobacco.

Fertilizers : Phosphatic guano 100 kg/acre.

The Varieties and spacings were :—

Varieties		*Spacings*	
Spanish	S_1	12″ × 12″	in holes 3 seeds/hole
Bunch	S_2	12″ × 15″	do.
Tirik	S_3	12″ × 18″	do.
Virginia Bunch ...	S_4	12″ × 12″	in drills
Vigan Lupog... ...	—	—	
Virginie	—	—	
Butt	—	—	
Gambia	—	—	
Cabris	—	—	

Results of Experiments :—

Date planted : 28.12.53 Yield in Kgms/Acre.
Date harvested : 11. 5.54 ± 148

Varieties / *Spacings*	*Cabris*	*Bunch*	*Spanish*	*Vigan Lupog*	*Butt*	*Virginie*	*Virginia Bunch*	*Tirik*	*Gambia*	*Mean* ±38·6
S_1	1,485	2,214	1,425	1,274	979	979	1,085	938	441	1.091
S_2	1,287	1,522	1,177	1,310	1,062	1,163	892	828	441	1,076
S_3	1,191	1.370	1,228	1,172	993	777	699	924	501	984
S_4	1,384	1,067	1,016	928	749	726	644	556	262	815
Mean ±74·5	1,336	1,293	1,212	1,171	946	911	830	811	411	991 ±24·6

Spacings and varieties are both significant :—

S.D. (5% P) spacing means 133·6 kg.
S.D. (5% P) variety means 221·0 kg.

Conclusions.—S_1, S_2, and S_3 are significantly better than S_4; i.e., planting in holes is better than planting in drills.

There is no significant difference between S_1, S_2 and S_3.

Varieties.—Cabris, Bunch, Spanish and Vigan Lupog are significantly higher yielders than Butt, Virginie, Virginia Bunch, Tirik and Gambia and of the latter group the first four are significantly higher yielders than the fifth.

(ii) *Trial on spacing and number of seeds per hole.*—The experiment was carried out at Pamplemousses experiment station in 1952–53 and repeated in 1953–54 at the same station.

Design.—Randomized blocks 4 replications in 1952–53 experiment, and 3 replications in 1953–54 experiment.

Variety :—The popular Cabris variety.

Spacings			*Number of seeds per hole*		
S_1	...	12″ × 12″	N_1	...	3 seeds/hole
S_2	...	12″ × 15″	N_2	...	4 seeds/hole
S_3	...	12″ × 18″	N_3	...	5 seeds/hole

1952–53 experiment :—

Planted : 17th December, 1952 ; harvested : 27th March, 1953.
Preceding crop : Yams.
No farmyard manure nor artificial fertilizer was applied.

Results : Yield in Kgms/acre ± 80·7

Spacing	*Number of seeds per hole*			
	N_1	N_2	N_3	*Mean* ± 46·6
S_1	3,076	3,234	2,938	3,082
S_2	2,836	2,931	3,407	3,058
S_3	2,987	2,845	2,674	2,835
Mean ± 46·6	2,966	3,003	3,006	2,991 ± 26·9

Spacings S_1 and S_2 are significantly better than S_3.

There is no significant difference between number of seeds/hole.

1953–54 experiment :—

Planted : 15th December, 1953 ; harvested : 13th April, 1954.
Preceding crop : groundnuts followed by a leguminous cover crop.
No farmyard manure nor artificial fertilizer was applied

Results : Yield in Kgms/acre ± 151·3

Spacing	*Number of seeds per hole*			
	N_1	N_2	N_3	*Mean* ± 87·3
S_1	2,304	2,537	2,622	2,488
S_2	2,290	2,212	2,290	2,264
S_3	2,290	2,288	2,188	2,255
Mean ± 87·3	2,295	2,345	2,367	2,336 ± 50·4

Both spacings and number of seeds per hole are not significant. It seems therefore that it is a waste of planting material to sow more than three seeds per hole.

(iii) *Propagation.*—Thirteen varieties were planted at Pamplemousses Experiment Station and ten at Central Experiment Station as look-see trial plots and for propagation. In addition, twenty-five varieties imported by the Food Production Board, were handed over to the Division and propagated at Pamplemousses Experiment Station. Seven of these varieties showed high susceptibility to sclerotial wilt. Further experimentation is contemplated.

(c) Maize

(i) *Experimental work on the control of the new rust disease.*

Early last year there was a sudden and severe outbreak of maize rust, caused by *Puccinia polysora* Und., in almost all the maize growing regions of the island.

The result was a high reduction in yield.

The main problem of research as regards maize diseases being the control of this new rust, the Plant Pathologist got in touch with the Maize Rust Research Unit at Ibadan, Nigeria, requesting a supply of seed of the best material already found resistant to the disease in that country.

Two-oz. samples of the following varieties were received and handed over to the Division, for experimentation with the cooperation of the Plant Pathologist :—

Varieties	*Type*
Mexican 2	Yellow Flint
Mexican 7	White Dent
Mexican 13	,,
Mexican 16	,,
Mexican 22	,,
La Creole	Yellow Flint
White Tuxpan	White Dent
Yellow Bounty	Yellow Flint
Sicaragua	White Dent

Experiments were started, at Central Experiment Station with these varieties and with local and Rodrigues imported maize, on 20th January, 1954 and 13th April 1954, in order both to carry out inbreeding by the "tassel-bagging method" so as to obtain a larger supply of seed material, and also to assess the resistance of these varieties to the new rust under our conditions.

As a result of the experiments, the following varieties showed promise of resistance in the two trials made : Mexican 7, Mexican 13 and Mexican 16. The results were confirmed by Dr. W. R. Stanton, of the Maize Research Unit, who found similar resistance under Nigerian conditions. Mexican 13 being considered particularly resistant.

These three varieties have been kept for further trials, but as they are White Dent, a type not much in favour in the island, two varieties of the Yellow Flint type : La Creole and Mexican 2, have also been selected for futher experimentation, although they showed a somewhat lesser degree of resistance.

A small supply of two other White Dent types was received from the Rust Research Unit : Mexican 1, stated to be rust resistant and high yielding and Mexican 5, stated to be best for direct multiplication under Nigerian conditions.

The varieties listed below have been planted in isolation plots, for pure seed production, as follows :—

At Central Experiment Station	Mexican 13
At Pamplemousses Experiment Station	Mexican 2, Mexican 5 and Mexican 7
At Richelieu	Mexican 16
At Barkly	Mexican 1
At Curepipe	La Creole

Local Maize plots have been planted at Central Experiment Station, Barkly Experiment Station and Richelieu Experiment Station for selection work to be carried out in that acclimatized variety.

(ii) *Weed control in maize plantation.*

The experimental work was carried out under the supervision of the Botanist of the Mauritius Sugar Industry Research Institute.

Four experiments were laid down, two at Central and two at Pamplemousses Experiment Stations. In these trials the potassium salt of M.C.P.A. (Agroxone 4) and a dimethylamine salt of 2.4–D (Palormone D) were used at 3 lbs. acid equivalent per acre, in pre–emergence and at different phases of development.

The weedkillers were applied as follows :—

(*a*) In pre–emergence—3 days after sowing
(*b*) 3 days after germination
(*c*) 6 days after germination
(*d*) 9 days after germination
(*e*) 12 days after germination
(*f*) 15 days after germination
(*g*) 20 days after germination

The following conclusions were arrived at :—

(*a*) Agroxone should not be applied in pre–emergence nor during the early phases of development. Such applications resulted in a significant decrease in yield. Special precautions should be taken when the weedkiller is applied at later stages.

(*b*) Palormone D does not appear to affect seriously maize development when applied in pre–emergence and during the early phases of growth. In fact, application in pre–emergence gave the best results.

(d) Yams

Trials with varieties shown in the table below were carried out at Curepipe, Central and Pamplemousses Experiment Stations. The fields did not receive any manure or artificial fertilizers before planting on ridges 4' apart.

YAMS VARIETY AND YIELD TRIAL 1954

Varieties	*Curepipe Experiment Station planted 9.11.53, harvested 7.6.54.*	*Reduit 12.11.53 20.9.54.*	*Pamplemousses 19.11.53 20.8.54.*
	Gross yield kgs/acre	*Gross yield kgs/acre*	*Gross yield kgs/acre*
Danish	18,452	12,342	15,109
Fugue	10,890	7,260	11,356
Oriental	12,705	12,160	14,620
Handeni I	13,916	12,705	35,822
Lisbon	13,612	13,794	16,143
B. N. Lisbon	16,183	14,520	14,008
Cush Cush	4,688	6,389	14,797
Light Red	1,058	11,798	25,840
Angiliala	3,478	11,253	9,887
Handeni IV	10,738	13,431	18,088
Bira Bukoba	10,615	19,094	—
Sealed Top	—	—	16,932
Crop	—	—	13,872
Kahata Kondol	—	—	13,736
Cambarre du Riz	—	—	14,280
Cush	—	—	19,475
Cambarre Betty	—	—	11,057
Horn	—	—	18,088

Variety Cush Cush, Light Red and Angiliala suffered from wilt at Curepipe experiment station.

Analyses for starch content are being carried out by the Chemical Division.

It does not look as if yams will ever become sufficiently popular for large scale plantations to be effected. In spite of the campaign carried out by the Nutrition Officer, ten years ago, the population will not take to yams. Yet, they are a very acceptable food. They may be boiled, mashed, fried, stewed or curried. Considering the high yeilds obtained in the experiments above a stock of the varieties listed, the highest yielders out of the 56 varieties planted in 1949, should be maintained at the experiment stations. They may prove a valuable addition to the diet in an emergency. Furthermore, yam plantations are not adversely affected by cyclones as maize for example.

(e) *Rice*

Variety trials were carried out at Pamplemousses experiment station, on the following rice varieties :—

Madagascar 732,	Umllatluza Valley,
Makalioka 34,	Century Patna.
Ratoons Well silo,	

The promising variety Makalioka alone was selected for further experimentation on a large scale at Pamplemousses, Richelieu and Curepipe experiment stations.

7. Fodder and Ensilage

(*a*) *Experiments with grass and fodder plants.* Small experimental plots were planted to test the performance of various grasses and fodder plants at Curepipe, Richelieu and Pamplemousses experiment stations. Propagation plots were also established at the other stations.

At Richelieu experiment station, plantations suffered heavily from drought, recruiting had to be done several times, yields were very low. The experiment will be repeated next year.

The following fertilizer treatments were applied :—

A—Control	
B—Sulphate of ammonia	100 kgs. per acre given in three applications during the year
C—Sulphate of ammonia	100 kgs. per acre given in three applications during the year
Superphosphate	100 kgs. per acre given before planting
D—Sulphate of ammonia	100 kgs. per acre given before planting
Superphosphate	100 kgs. per acre given before planting
Muriate of potash	30 kgs. per acre, applied with the first dressing of sulphate of ammonia 4—6 weeks after planting.

TABLE IV

Yield in Tons per acre

Species	Pamplemousses Experimental Station (planted 22.2.54)					Curepipe Experimental Station (planted 15.1.54)					Chemical Composition (Analyses carried out on grasses from NPK plots at Cpe E.S.)								
												Percentage dry matter							
	Date cut	O	N	NP	NPK	Date cut	O	N	NP	NPK	% original matter moisture	Ash	Fibre	Proteins	Ether extr.	Carbo hydr:	N	P_2O_5	K_2O
Pennisetum purpureum (elephant grass)	3. 6.54	13·56	20·71	23·06	23·91	10. 5.54	4·46	2.29	7·78	8·26	—	—	—	—	—	—	—	—	—
	11.10.54	13·88	14·63	15·16	19·86	10.12.54	6·73	4·69	9·30	10·96	—	—	—	—	—	—	—	—	—
	31.12.54	12·83	16·65	20·92	27·76	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		40·27	51·99	59·16	71·53		11·19	6·98	17·08	19·22	73·0	14·00	38·62	7·87	1·14	38·87	1·04	0·34	1.30
Panicum sp.	1. 6.54	9·61	12·28	16·55	19·11	10. 5.54	·42	24	2·77	2·71	—	—	—	—	—	—	—	—	—
	11.10.54	4·27	3·20	3·74	5·55	10.12.54	4·99	3·10	4·84	6·65	—	—	—	—	—	—	—	—	—
	31.12.54	5·34	5·34	4·70	8·33	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		19·22	20·52	24·99	32·99		5·41	3·34	7·61	9·36	82·0	8·51	32·20	12·62	0·79	45·88	1·76	0·44	2·94
Panicum maximum	4. 6.54	4·75	5·44	6·62	7·93	10. 5.54	2·96	3·02	9·47	7·48	—	—	—	—	—	—	—	—	—
	12.10.54	4·91	4·27	6·19	5·23	10.12.54	4·84	6·12	10·13	9·68	—	—	—	—	—	—	—	—	—
	31 12.54	4·91	5·12	5·98	5·34	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		14·57	14·83	18·79	18·50		7·80	9·14	19·60	17·16	81·0	7·42	38·39	11·44	0·45	42·30	1·53	0·42	1·58
Setaria Bua River	5. 6.54	11·96	15·16	18·15	15·21	10. 5.54	5·43	8·57	18·10	24·98	—	—	—	—	—	—	—	—	—
	19.10.54	4·06	5·12	5·23	4·06	10.12.54	17·31	25·02	18·90	27·14	—	—	—	—	—	—	—	—	—
	24.12.54	10·36	10·36	9·78	7.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		26·38	30·64	33·16	26·74		22·74	33.59	37·00	52·12	81·0	4·91	40·50	6·00	0·90	47·69	1·20	0·32	1·53

Setaria Kazungula	5. 6.54	10·03	14·20	18·04	16·65	10. 5.54	7·96	7·66	11·82	14·00	—	—	—	—	—	—	—	—	—
	12.10.54	7·58	8·54	8·11	8·54	10.12.54	10·66	9·83	11·42	13·46	—	—	—	—	—	—	—	—	
	24.12.54	5·71	5·66	6·87	6·19	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		23·32	28·40	33·02	31·38		18·62	17·49	23·24	27·46	75·0	10·69	36·64	4·76	1·02	46·89	0·85	0·31	1·02
Panicum makarikari	5. 6.54	10·46	18·15	19·22	17·19	10. 5.54	2·05	1.93	8·63	8·99	—	—	—	—	—	—	—	—	—
	18.10.54	4·91	4·48	3·63	4·70	10.12.54	3·10	6·05	8·09	8·84	—	—	—	—	—	—	—	—	—
	31.12.54	4·91	4·48	5·76	5·60	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		20·28	27·11	28·61	27·55		5·15	7·98	16·72	17·83	77·0	4·80	28·94	7·62	1·38	57·26	0·96	0.33	0·79
Cheoris Ghyana (giant Rhodes grass)	8. 6.54	8·37	11·10	11·74	13·28	10. 5.54	1·21	2·11	4·77	6·76	—	—	—	—	—	—	—	—	—
	12.10.54	5·34	4·27	4·06	5·12	10.12.54	8·39	8·39	7·18	10·73	—	—	—	—	—	—	—	—	—
	31.12.54	5·98	5·34	4·27	4·06	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		19·69	20·71	20·07	22·46		9·60	10·50	11·95	17·49	80·0	6·14	34·30	9·44	0·79	49·33	1·50	0·39	1·13
Melinis minutiflora (molasses grass)	1. 6.54	13·02	18·47	20·50	19·54	10. 5.54	1·93	1·75	7·60	7·90	—	—	—	—	—	—	—	—	—
	14.10.54	7·05	5·55	6·94	6·83	10.12.54	7·11	5·44	6·27	7·18	—	—	—	—	—	—	—	—	—
	31.12.54	7·47	6·83	7·47	8·11	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		27·54	30·85	34·91	34·48		9·04	7·19	13·87	15·08	79·0	4·21	31·13	14·50	1·05	47·11	1·44	0·47	1·19
Paspalum Paniculatum	9. 6.54	6·41	7·69	7·90	6·83	10. 5.54	2·29	2·65	5·19	6·82	—	—	—	—	—	—	—	—	—
	14.10.54	3·84	5·12	5·66	4·48	10.12.54	4·84	4·91	5·37	8·47	—	—	—	—	—	—	—	—	—
	31.12.54	2·99	2·99	3·31	4·48	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		13·24	15·80	16·87	15·79		7·13	7·56	10·56	15·29	78·0	5·64	32·32	8·31	0·68	53·05	2·10	0·67	2·37
Australian *Paspalum*	8. 6.54	5·34	9·82	12·38	10·46	10. 5.54	2·29	2·17	4·52	6·70	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	10.12.54	4·31	5·29	4·23	6 05	—	—	—	—	—	—	—	—	—
	31.12.54	5·34	5·34	6·62	5·12	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		10·68	15·16	19·00	15·58		6·60	7·46	8·75	12·75	78·5	5·58	28·42	9·06	1·58	55·36	1·46	0·38	1·19

TABLE IV—*continued*

Species	Pamplemousses Experimental Station (planted 22.2 54)					Curepipe Experimental Station (planted 15.1 54)					Chemical Composition (Analyses carried out on grasses from NPK plots at Cpe E.S.)								
	Date cut	O	N	NP	NPK	Date cut	O	N	NP	NPK	% original matter moisture	Percentage dry matter							
												Ash	Fibre	Proteins	Ether extr.	Carbohydr:	N	P_2O_5	K_2O
Paspalum notatum	2. 7.54	·64	1·07	1·49	1·58	10. 5.54	0·90	1·09	·84	·60	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	10.12.54	0·76	1·89	1·89	2·12	—	—	—	—	—	—	—	—	—
	31.12.54	2·78	2·78	1·81	2·99	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		3·42	3·85	3·30	4·57		1·66	2·98	2·73	2·72	81·0	12·45	22·29	9·00	1·18	55·08	2·27	0·66	1·47
Pennisetum clandestinum (Kikuyu)	9. 6.54	3·95	7·58	7·05	6·62	10. 5 54	2·77	2·65	5·55	6·45	—	—	—	—	—	—	—	—	—
	18.10.54	6·19	5·76	6·41	5·98	10.12 54	4 23	5·59	4·38	5·90	—	—	—	—	—	—	—	—	—
	31.12.54	1·92	2·13	1·49	2·78	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		12·06	15·47	14·95	15·38		7·00	8·24	9·93	12·35	77·5	4·20	28·81	19·56	1·01	56·42	1·60	0·45	1·64
Ischaemum aristatum (herbe d'argent)	—	—	—	—	—	10. 5·54	2·53	4·22	8·93	8·33	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	10.12.54	3·48	4·54	6·20	6·73	—	—	—	—	—	—	—	—	—
TOTAL ...		—	—	—	—		6·01	8·76	15·13	15·06	76·5	6·24	34·37	6·12	1·15	52·12	1·00	0·35	1·24
Akarea cocksfoot	—	—	—	—	—	10. 5.54	·12	·12	·48	·66	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	10.12·54	2·19	2·27	7·18	5·59	—	—	—	—	—	—	—	—	—
TOTAL ...		—	—	—	—		2·31	2·39	7·66	6·25	81·0	22·80	27·35	10·31	2·64	36·90	2·86	0·64	4·0

Phalaris tuberosa (pl: 22.1 54)	14.10.54	—	—	—	2·49	10. 5.54	—	—	·78	1·33	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	10.12.54	—	—	4·23	4·38	—	—	—	—	—	—	—	—	—
TOTAL ...		—	—	—	2·49		—	—	5·01	5·71	85·0	8·79	24·81	19·94	2·00	44·46	2·87	0·68	2·60
Chloris teso (pl: 22.1.54)	14.10.54	—	—	—	—	10. 5.54	—	—	2·59	4·28	—	—	—	—	—	—	—	—	—
	29.11.54	—	—	—	—	10.12.54	—	—	3·93	2·12	—	—	—	—	—	—	—	—	—
	29.12.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		—	—	—	33·21		—	—	6·52	6·40	76·5	5·29	37·15	6·75	0·91	49·90	1·05	0·36	1·30
Chloris teso (pl: 30.3.54)	27. 8.54	—	—	—	19·06	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cenchrus ciliaris	14.10.54	—	—	—	—	10. 5.54	—	—	2·05	1·69	—	—	—	—	—	—	—	—	—
(pl: 22.1.54)	29.11.54	—	—	—	—	10.12.54	—	—	2·11	2·65	—	—	—	—	—	—	—	—	—
	29.12.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		—	—	—	24·03		—	—	4·16	4·34	75·0	6·18	34·98	8·19	1·37	49·28	1·33	0·38	1·64
Cenchrus ciliaris	29.11.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(pl: 20.3.54)	29.12.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		—	—	—	23·37	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sorghum Sudanense	8. 6.54	—	—	—	—	10. 5.54*	—	—	·72*	1·15*	—	—	—	—	—	—	—	—	—
(pl: 22.1.54)	27. 8.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...		—	—	—	30·37		—	—	·72*	1·15*	—	—	—	—	—	—	—	—	—
Chloris gayana (pl: 30.3.54)	14.10.54	—	—	—	17·21	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Plants were all diseased and died.

Conclusions

1. There is a great variability in yield between the grasses as well as between the same grass at the two experiment stations.

2. Fertilizer applications have given considerable increases in yield at Curepipe i.e., in the highly leached soil of the upland plateau. As expected, the plants have responded particularly well to phospatic fertilizers. Increases in yield have not been so striking at Pamplemousses.

3. Some Species, particularly *Setaria* of Bua River, seem to be specially suited to the conditions prevailing in the high rainfall area. The *Panicums* do not seem to do so well in that region. *Pennisetum purpureum* on the other hand, is a very promising fodder grass at Pamplemousses experiment station.

(*b*) *Experiment with* LEUCÆNA GLAUCA. Experimental plots were laid down, in 1953, to test the performance of the protein-rich leguminous fodder plant " Acacia ", *Lucaena glauca*, at Richelieu experiment station. Seven spacings and two heights of cut were experimented with. Yields on the whole were low on account of the abnormal weather conditions that prevailed. Only two cuts were taken. A third harvest was contemplated for the end of the year, but due to the dry speli that prevailed, no cut was taken. The best yields obtained were of the order of 20 tons per acre.

As far as spacing is concerned, the closest spacing, i.e., drills 2′ apart gave highest yields. Cuts were taken at 1½′ and 3′ above ground level. There does not seem to be a significant difference between heights of cut.

" Acacia " was planted at very close spacing, in a new field covering just over one acre ; the seeds were sowed in drills one foot apart. The " acacia " will be used in the silage experiments with molasses.

(c) *Ensilage*

Object of the experiments.—To find out whether silage production is an economic proposition for the one-cow man.

Two small silos of about 1,600 cubic feet capacity have been constructed at the Richelieu Experiment Station. The first at a cost of Rs. 3,957 and the second, of a slightly different design, at a cost of Rs. 4,942.

A chaff cutter was purchased for Rs. 1,200 to be used in connection with the filling of the silo.

First Experiment.—The first silo, to be called silo A, was filled with 22,780 kilogs of chaffed cane tops in November 1952. The silo was opened 5 months later and 16,980 kilos of good silage—representing a yield of 74·5 per cent—were obtained out of 20,755 kilos removed from the silo. 3,755 kilos represented spoilt silage, recovered from the bottom, side and top layers, due to surface deterioration. The unrecovered balance was due to shrinkage and loss inevitable as an inherent part of the chemical changes which accompany all ensiling. The silage was found to be sweet and pleasant. It was fed to young stock and readily accepted. Chemical analysis confirmed the good quality of the silage obtained.

The cost of production, not taking into account the cost of technical supervision and the value of the cane tops, worked out as follows :—

	Rs.	*c.*
Depreciation on silo (1/20th)	197	86
Depreciaiion on chaff cutter (½ of 1/20th)	30	00
Assuming silo is used once a year :		
Cost of collecting, carting, chaffing, filling and emptying silo	1,011	63
TOTAL ...	1,239	49

This represents Rs. 73.00 per ton (i.e., Rs. 3.65 per 100 lbs.)

Second Experiment.—The second silo, to be called silo B, was filled with 18,150 kilogs of chopped maize stalks and leaves in April 1953. When the silo was opened in June 1954, i.e., 14 months later, 6,000 kilogs of good silage were obtained representing a yield of only 33 per cent. The experiment was not a success and the cost of production worked out, on the same lines as previously to the unexpectedly high figure of Rs. 10.34 per 100 lbs of silage.

The good silage was fed to stock at the Government Dairy. Results of the feeding experiments are given further on.

Third experiment.—Silo A was filled once more with cane tops in October 1953. This time a shredder-blower was used instead of the chaff cutter. The shredder-blower cost Rs. 2,700. 13,000 kilogs of shredded cane tops went into the silo.

The silo was opened in May 1954 i.e., 7 months later. It was observed that the ensilage had sunk to a depth of 4 feet. The spoilt-silage in the top, side and bottom layers varied in thickness between 8" and 1½ feet. 8,300 kilogs of good silage, representing a yield of 63·8 per cent, were obtained and sent to the Government dairy for feeding experiments.

The cost of production worked out as follows :—

	Rs.	*c.*
Depreciation on silo (1/20th)	197	86
Depreciation on shredder blower (½ of 1/20th)	67	50
Cost of collecting, carting, chaffing filling and emptying silo	324	01
TOTAL ...	589	37

This represents Rs. 71.00 per ton (i.e., Rs. 3.55 per 100 lbs).

Chemical analysis of the silage samples gave the following results :—

	Cane top silage (chaffed)	*Cane top silage (shredded)*	*Maize silage (chaffed)*
Moisture %	80	72·5	71·5
Composition % Dry matter: –			
Ash	8·18	9·95	14·53*
Crude Protein	5·65	4·09	7·34
Fibre	33·86	29·05	32·72
Ether extract (1)	1·60	1·46	1·26
Carbohydrates	50·71	55·45	44·15
Volatile organic acids (2)	0·35	0·71	1·3
Non-volatile organic acids (3) ...	7·15	7·09	5·07
Amino-acids (4)	0·90	0·15	0·89
Volatile bases (4)	0·14	0·25	0·91
True proteins	4·88	2·98	5·69

(1) Not taking into account the volatile organic acids
(2) Expressed as acetic acid
(3) Expressed as lactic acid
(4) Expressed as crude proteins

* Samples contaminated with soil.

In the three samples the ratios non volatile organic acids/volatile organic acids indicate a good silage but whereas in the first sample the dry matter figure 20 per cent and the ratio amino acids/volatile bases are also indicative of a good silage, in the other two samples the figures indicate that decomposition had started through mould development.

It appears, therefore, that the ensiling process went on smoothly in the first experiment. Faults in ensiling in the second experiment have been indicated. They occurred to a lesser degree in the third.

Experiments are being continued and in fact the first silo has been filled with cane tops and grasses grown at Richelieu Experiment Station. The second silo is to be filled with acacia sprinkled with molasses. It appears that the cost of production of good quality silage will be round about Rs 3.50 per 100 lbs.

Silage feeding trials at Government Dairy.—Feeding trials were carried out by the Animal Husbandry Officer during the period 27th May to 15th June, 1954.

The objects of the experiment was to assess the value of cane tops and maize silages as partial substitutes for green fodder.

The green fodder used was mature "herbe d'argent" (*Ischaemum aristatum*) now naturalized in the neighbourhood of the Dairy, and was in fact what the whole herd had been on for some weeks. All the animals received their usual ration of 20 per cent protein concentrates in proportion to the amount of milk produced. Twice a day milkings were recorded in kilograms.

Lay out of Experiment.—Twenty-seven cows in milk were divided into two groups producing approximately the same total amount of milk per day and in which all stages of lactation were fairly represented.

The experiment is tabulated below :—

	Group I	*Group II*
No. of animals	13	14
First 14 days	received cane tops silage at the rate of 50 lbs per day *plus* concentrates	received "herbe d'argent" ad lib. as usual *plus* concentrates.
Remaining 6 days	received maize silage with molasses at the rate of 50 lbs per day *plus* concentrates	

NOTE :—The cane silage was readily eaten from the start but the animals refused the maize silage probably on account of its greater acidity. They accepted it after addition of molasses.

The following table summarizes the results :—

Group	*Total daily production in kilogram*		*Percentage decline in yield*	*Average daily production*
	Start	*Last (20th day)*		
			%	
I	98·1	88·9	9·37	94·4
II	96·7	86·0	11·07	92·6

The difference is not significant.

The percentage decline in yield for both groups was higher than usual owing to the comparatively large proportion of pregnant animals.

Conclusions

(*a*) It seems that the cost of production of good quality silage is round about Rs. 3.50 per 100 lbs. Experiments are to be carried out with pit and trench silos in an attempt to bring down cost of production.

(*b*) Some of the causes of faults in silage making have been traced and further experimentation planned especially with the protein rich *Leucaena*, sprinkled with molasses.

(*c*) As far as feeding experiments are concerned, there is no drop in milk production when silage is fed but at the same time there does not seem to be any difference in average daily milk production when either silage or green fodder is fed.

(d) Hay Making Experiments

(i) *Field Experiments.*—A Pilot Scheme was started in 1951 under the supervision of the Animal Husbandry Branch, in order to find out whether it was possible to produce nutritious fodder, preferably in the form of hay, economically, on aerodrome lands for sale to cattle owners as a contribution to milk production. By the end of the year fifty-one acres of land had been bulldozed. The officer in charge of the scheme went on overseas leave in 1952, and it was only at the beginning of 1953 that the first plot of land was ready for planting. By the end of the year the following plantings and sowings had been carried out :—

	Acres
Tropical Kudzu (*Pueraria javanica*)	8
Lucerne (*Medicago sativa*)	3
Perennial Lespezeda (*Lespedeza cuneata*) ...	1
Molasses grass (*Melinis minutiflora*)	1½
Elephant grass (*Pennisetum purpureum*) ...	2½
Guinea grass (*Panicum maximum*) var : Petite Fataque	1
,, var : Grande Fataque (*Panicum maximum*)	1
Dallis grass (*Paspalum dilatatum*)	1
"Acacia" (*Leucaena glauca*)	1
TOTAL ...	20

In addition, 25 acres of land had been bulldozed and raked, of which 3 acres had been put under kudzu.

The plantations were doing fairly well with the exception of *Lespedeza* which germinated very poorly and after three sowings was considered a failure. Kudzu was doing particularly well, growing in a thick carpet and smothering all the weeds. Lucerne was badly affected by a leaf eating insect, *Nacolea* and rapid invasion by weeds followed, with the result that frequent hand weedings had to be carried out.

The biggest problem, however, was set by the very gravelly nature of the soil. After each agricultural operation, the cultivation implements brought to the surface an innumerable number of small stones, which had to be removed by hand before the mower could be used. Hand weeding therefore had to be resorted to and proved just as costly.

In 1954, plantations of Kudzu, the most promising fodder plant, were invaded by dodder and in a surprisingly short time were covered by a carpet of the parasite.

A survey of the experimental fields was carried out in April and it was decided, considering the high costs of production and the conditions in the fields, to maintain only the best 10 acres until the next planting season.

The scheme was taken over by the Agricultural Division in July 1954 and up to the end of the year the following operations had been carried out :—

(*a*) Roads have been opened and experimental plots properly delimited.

(*b*) Scrub vegetation on stone walls, covering an area of approximately 6 acres, has been destroyed and "acacia" is being established, thus increasing the effective area of the station.

(*c*) The following experimental plots have been retained :—

	Acres
Molasses grass	3·11
Dallis grass	2·43
Guinea grass (var : petite fataque) ...	0·92
Elephant grass	2·52
Lucerne	2·23
TOTAL ...	11·21

After a botanical survey, control of weeds in all the grass plantations was done by means of selective weed-killers, with excellent results.

Lucerne still heavily parasitized by *Nacolea* is proving a failure. The grasses are doing well.

(*d*) An attempt was made to control dodder in the Kudzu plantations. To that end, various selective weedkillers at various concentrations were experimented with in order to kill dodder without unduly affecting the kudzu. Ten different treatments were carried out but gave negative results. The whole plantation was therefore destroyed using the flame cultivator.

(*e*) Sixteen acres have been discploughed and harrowed. The land is ready for planting when the rains come. The following fodder plants are to be experimented with :—

Panicum makarikari, *Chloris gayana*, *Setaria hazungula*, *Setaria* of Bua River, *Pennisetum clandestinum* and *Leucaena glauca*.

(*f*) A strip covering an area of approximately 12½ acres is being kept by selective weedkillers under *Cynodon dactylon*, along the runway, in order to allow the belly landing of an airplane to take place in an emergency.

The experiment station now covers 61·35 acres and is divided as follows :—

Experimental fields under :—

	acres	*acres*
Cultivation...		11·21
Ready for planting		16·03
To be prepared		7·21
Stone walls—cleared and put under "acacia"	5·87	
To be cleared	1·36	
		7·23
Roads		5·80
Strips under *Cynodon*		12·32
Bare strips along taxiways and runway		1·55
TOTAL		61·35

(ii) *Experiments with the Slade-curran Drier.*—The drier was erected in 1953.

Shredded cane tops, elephant grass, molasses grass and guinea grass (var : petite fataque), were dried in the Curran drier and baled. The cane tops were shredded in a cutter chopper driven by a Ferguson tractor. The material was first dried in the tray, then transferred to a second chamber in which spent gases completed the drying and finally baled in a Pick-up Baler. All material was dried rapidly and satisfactorily in the drier, with the exception of the shredded cane tops. The latter owing to its heterogeneous nature had to be turned three times in the drying tray. The hay was of very good colour and appearance.

Samples of hay were analysed by the Chemical Division and the results are shown in the following table. All samples have been calculated at 13 per cent humidity—the average humidity—for comparison purposes :—

HAY MADE IN CURRAN DRIER

	Cane tops	*Elephant grass*	*Molasses grass*	*Guinea grass—var. petite fataque*
Moisture	13·00	13·00	13·00	13·00
Ash	7·67	11·42	8·69	13·41
Fibre	30·11	29·72	32·42	30·79
Proteins	3·29	2·80	4·62	5·12
Fat	1·25	·98	1·82	1·60
Carbohydrates...	44·68	42·08	39·45	36·08
	100·00	100·00	100·00	100·00
Starch equivalent	35·7	33·8	36·00	33·91
Albuminoid ratio	16·3	16·5	10·00	10·21

Cane tops are abundant during the season of cane harvest—July to December. It is estimated that at least half a million tons are available each year. Some of the fresh cane tops is used mainly by the one-cow-man and the remainder left in the field.

The conservation of cane tops has never been attempted on a large scale in Mauritius. Ensilage holds out possibilities the economics of which have not yet been fully investigated. If cane tops were to be turned into hay, the main item of expenditure in the drying would be the cost of fuel. Driers. however, could be installed on sugar estates and the hot gases of combustion from the furnaces of sugarcane mills could be used to dry the shredded cane tops.

8. Fibre

Furcraea.—Seven trials laid down in 1950 were cut, for the second time, during the year and one trial laid down in 1951 was cut for the first time, with the following results :—

TABLE V

Trial No.	*Type of Trial*	*Spacement (feet)*	*No. of plants per acre*	*Weight of leaves cut/acre Tons*		*Yield dry Fibre/acre Kgs*		*Dry Fibre % green leaf*	
				1953	*1954*	*1953*	*1954*	*1953*	*1954*
1/50 ...	Spacing	12×3×2	2,904	7·55	6·34	98·2	101·8	1·30	1·57
3/50 ...	do.	6×2×4	2,722	7·26	6·70	115·1	97·8	1·58	1·46
4/50 ...	do.	8×2×4	2,178	8·35	6·44	99·7	81·8	1·58	1·27
5/50 ...	do.	12×2×3	2,074	5·85	4·78	77·0	71·2	1·32	1·49
	do.	13×2×3	1,936	4·92	4·12	65·0	57·2	1·32	1·42
		5×5	1,744	9·88	7·91	148·2	112·2	1·50	1·41
2/50 ...	Var : Richelieu	12×3×2	2,904	9·63	5·94	143·3	84·2	1·49	1·45
	Var : Sorez	,,	2,904	8·89	6·42	125·4	90·8	1·41	1.43
	Var : Terre Rouge	,,	2,904	7·04	6·19	97·7	99·7	1·39	1·59
6/50 ...	With "acacia"	9×3×3	2,420	6·22	5·99	87·0	87.7	1·32	1·46
	Without "acacia"	,,	2,420	3·36	4·33	44·3	57.7	1·32	1·33
7/50 ...	With "acacia"	12×3×3	1,936	5·52	5·45	75·1	92·5	1·36	1·60
	Without "Acacia	,,	1,936	4·21	4·67	68·2	54·5	1·62	1·14
12/51 ...	Spacing	7×3×2	4,356	—	27·07	—	626·4	—	2·4
	do.	8×3×2	3,960	—	22·80	—	554.2	—	2·3

In the 1950 spacing trial, planting 5×5 feet has again given the best result. This cannot be accounted for by spacing itself as other trials show that the closer the spacing the better the yield. In the 5×5 feet planting there are only 1,744 plants per acre as compared to 2,904 in the 12×3×3 feet. The reason for the higher yield seems to be due to the fact that competition with weeds is reduced to a minimum in the 5×5 feet plots. In the double row spacing weeds are cut between but not within the double rows whereas in the 5×5 feet spacing all weeds are cut.

Growing Furcraea in association with "acacia" has again given better results.

As far as the 1951 spacing trials are concerned, it would be rash to draw any definite conclusions at this stage. Observations however, seem to indicate that the following factors may have contributed to the high yields :—

(*a*) larger number of plants per acre

(*b*) better soil conditions

(*c*) complete weeding, i.e., between and within the double rows.

The Furcraea plants in this trial, though younger, are taller and more vigorous than plants in the other trials.

9. Tobacco

Weather conditions.—Climatic conditions on the whole were not unfavourable for good vegetative growth. The total rainfall was slightly below average. Temperature approximated very much to normal throughout the year.

Seed Bed.—Seed rate experiments have shown that when plants are raised for direct transplants, sowing 4 c.c. of seed per bed of 100 square feet gives better results than 3 c.c. or 5 c.c. of seed per bed.

Sowing and potting in John Innes' compost.—Two experiments were carried out :—

(*a*) On the 26th January, three varieties : Bonanza, Jamaica Wrapper and Amarello were sown in cases at Barkly. The sowing medium was composed, of 2 parts sterilized loam, 1 part compost, 1 part sand, and superphosphate at the rate of 2 lbs per square yard of mixture. The seed germinated well between five and 6 days. The seedlings were then pricked on to earth blocks of the following composition : 7 parts sterilised loam, 3 parts sand, 2 parts compost, and fertilisers at the rate of 4 lbs sulphate of ammonia, 4 lbs superphosphate and 2 lbs sulphate of potash per cubic yard of mixture. A first lot of Bonanza and Jamaica Wrapper seedlings were potted on the 5th February and a second lot on the 10th. The first lot made more rapid progress than the second, indicating that pricking should be done as early as possible. The Amarello seedlings were potted on the 6th February. All plants in the earth blocks made rapid progress, were entirely free from spot diseases, and were ready for transplanting in the field at Richelieu on the 24th and 25th February. Young Yellow Mammoth plants (sown on beds on the 22nd January at Richelieu) were very far behind the plants in earth blocks but were transplanted with great care in the fields on the 25th January alongside the other varieties. The superiority of the soil block

method over the direct transplanting method was very striking and was continued throughout the life cycle of the plants in the field. In the first case there was almost no shock at transplanting and no recruiting. Growth was very rapid and uniform and the leaves were harvested about 3 weeks earlier than with the second method.

(*b*) A second experiment was carried out at Pamplemousses. Sterilization of the soil being the most expensive item in the preparation of the soil blocks, the experiment was divided into 2 parts—

(i) with sterilized loam and

(ii) with unsterilized loam.

The mixtures used in the preparation of the earth blocks were :—

(*a*)	7 parts loam	3 parts sand	2 parts compost
(*b*)	7 parts loam	3 parts sand	2 parts farmyard manure
(*c*)	7 parts loam	3 parts sand	2 parts goat manure
(*d*)	3 parts loam	2 parts sand	7 parts farmyard manure
(*e*)	3 parts loam	2 parts sand	7 parts goat manure

The observations were : —

(*a*) plants growing in blocks containing sterilised loam were free from spot up to the transplanting stage whereas plants growing in blocks containing unsterilised loam were heavily spotted.

(*b*) The greater the porportion of manure in the soil block, the quicker the growth.

(*c*) Goat manure gave slightly better results than farmyard manure.

It appears therefore that sterilisation of the soil used in the preparation of the earth blocks is essential. The percentage of loam however, should be considerably reduced in order to bring down the cost of production of the soil blocks.

Area.—The total area under tobacco this year was approximately 14 acres distributed as follows : Richelieu Experiment Station—11 acres, Pamplemousses Experiment station—3 acres. Tobacco followed sugarcane at Richelieu and groundnuts at Pamplemousses.

Holing and manuring.—The spacing adopted for tobacco was 3'×2'. Holes were dug with the 'pioche' and manure applied in the holes. These were then refilled with earth, and the earth and manure mixed together by hand. Two basket of farmyard manure and 1 basket of goat manure (1 basket=½ cubic foot) were applied per row of 36 holes.

In all plantations, fertilizers were applied at the rate of 60 kilogs sulphate of ammonia, 187½ kilogs superphosphate and 37½ kilogs of sulphate of potash per acre for Amarello and air-cured varieties ; the above quantities being reduced to 40 ; 150 and 25 respectively for flue-cured Virginian varieties. The fertilizer mixture was applied half at planting time, the other half three weeks later, 2 inches from the base of plants in holes 3 inches deep.

Hand watering versus overhead irrigation.—Two fields were planted at Richelieu with the variety Amarello, in the second half of January. The weather was hot and dry. Watering by hand was done in the first field and watering with the Sigmund overhead irrigation equipment in the second. The plants had been well hardened before transplanting. Afternoon planting was done throughout.

In the first field, watering was carried out before and after planting, using watering cans. Thereafter the plants were watered every morning and afternoon. At the end of the week the stand was only 40 per cent despite two recruitings.

In the second field, the land was watered with the Sigmund equipment before and after planting and daily afterwards. Only a few plants died on the borders where watering was imperfect owing to wind effect. The field was recruited within one week and a good stand secured.

The first field was then watered with the Sigmund equipment and recruited. A good stand was secured within one week.

Amarello.—At Richelieu, two fields, covering a total area of 3 acres, were planted with the variety Amarello, a heavy Burley type, the chief tobacco variety grown on a commercial scale in Mauritius. The plantation was done in the second half of January. The weather was dry and hot, but watering with the sprinkler enabled a good stand to be maintained until the rains started in February. Growth was fair and harvest was started at the end of March. The months of February and March were very wet and the leaf harvested was rather thin. Towards the end of April, harvest was delayed owing to insufficient barn accommodation at Richelieu. The result was that frog eye spread considerably in the fields and caused a severe reduction in the percentage of bright leaf in subsequent curings.

Yield of leaf from the two fields was 768 kgs/acre. The grading was 4 per cent bright, 36 per cent medium and 60 per cent dark. The latter figure is high and is attributed to frog eye. Selection was carried out on 1,200 plants and 21 kgms of clean seed obtained.

At Pamplemousses, one field covering one acre was planted under Amarello, in February. Harvest was started at the end of April. Alternaria leaf spot was noticed in the plantation in May and spread considerably in June and July. Consequently no seed was collected from these plantations.

Curing gave a high proportion of bright leaf at first, but Alternaria spot caused a rapid deterioration of colour. A high proportion of the leaf was lost. The mean yield of graded leaf was just over 200 kilogs per acre, with 4 per cent bright, 43 per cent medium and 53 per cent dark.

Flue-cured virginian varieties.—The chief variety grown at Richelieu was a strain Yellow Mammoth, produced at the station which has shown considerable resistance to Black Shank disease during the last four years. Black Shank is the most disastrous disease of tobacco in Mauritius, and all imported flue-cured Virginian varieties are highly susceptible to the disease.

A 3-acre field of Yellow Mammoth was planted in February. A good stand was secured from the start ; the plantation progressed satisfactorily and harvest began in April. Barn accommodation again proved insufficient and harvest had to be delayed with the result that leaf was lost through frog eye disease. Very few plants died of Black Shank disease. The stand at the end of harvest was 90·4 per cent. The average yield of graded leaf was 422 kilogs per acre. Bright 7 per cent medium 51 per cent and dark 42 per cent. Selection was carried out and 3 kilograms of clean seed obtained.

Small plot of the varieties Yellow Mammoth, Bonanza, Jamaica Wrapper and Amarello were planted in February at Richelieu. At the end of harvest, stand of the various varieties was : 87·5 per cent, 61·8 per cent, 36·1 per cent and 97·2 per cent respectively. Amarello, the control, is highly resistant to Black Shank disease. Yellow Mammoth again proved to be the most resistant of the Virginian varieties.

As Black Shank is much less prevalent at Pamplemousses than at Richelieu, all flue-cured Virginian varieties other than Yellow Mammoth were planted at Mon Rocher. All plantations had a good start but a severe outbreak of Alternaria leaf spot resulted in heavy losses and only a small percentage of leaf was harvested and cured.

Black Shank resistant hybrids.—A number of hybrids of Rg. (a cigar wrapper variety resistant to Black Shank disease, imported from Florida, U.S.A) and flue-cured Virginian varieties were planted at Richelieu, in March. The original crosses were started in 1945 and the first generations of hybrids had shown considerable resistance to Black Shank disease, but the leaf had cured with an objectionable greenish tinge. Continued back crosses on to the flue-cured Virginian parents had resulted in an improvement of leaf colour. During the last season leaf could be cured satisfactorily with that of the parent varieties.

The yields of the hybrids were at least equal to the yield of Yellow Mammoth. Despite a severe infection of the roots, a good stand was obtained up to the end of harvest. The percentage of root infection by Blank Shank and Nematodes and the stand of the hybrids at the end of harvest are shown in the following table. The resistant strain of Yellow Mammoth serving as control :—

	Stand %	% Root infection	
		Black Shank	*Nematodes*
YM	93·6	68·7	79·9
Rg × Bo.	79·7	87·2	90·6
Rg × JW	87·9	52·2	56·1
Rg × VB	86·1	88·9	92·5
Rg × WM	86·3	94·5	95·1
Rg × YM	84·5	93·2	95·0
Rg × WO	69·6	55·3	77·6

YM = Yellow Mammoth
Bo. = Bonanza
JW = Jamaica Wrapper
VB = Virginia Bright
WM = White Mammoth
WO = White Stem Orinoco

Manurial Experiment.—The 1953 experiment was repeated. There were again five treatments :—

t_1 ... Control (no manure)
t_2 ... 5 tons of farmyard manure per acre
t_3 ... 10 tons of farmyard manure per acre
t_4 ... 2 tons of goat manure per acre
t_5 ... 2 tons of goat manure + 5 tons of farmyard manure per acre

In addition all plots received a mixture of complete fertilizers at the usual rate. There were 4 replications and plot size was approximately $\frac{1}{10}$ acre. The experiment was planted with the Black Shank resistant strain of Yellow Mammoth at the beginning of March. Progress was fair. Incidence of frog eye was high in May–June and affected adversely the colour of the cured leaf. Owing to insufficient barn accommodation it was not possible to cure the leaf of each plot separately throughout the curing season, That was done only in the case of the second and the third primings in order to assess the grade index. In addition, the green leaf of each plot harvested in the field was weighed for the first five primings in order to assess yields. Cured leaf can be taken in order to assess yields in the various treatments as ten percent of green leaf harvested. The following table summarizes the results of the experiment :—

	Weight of green leaf for five primings (kg per plot) ± 4·67	*Grade Index of 2nd and 3rd primings ±14·9*	*% stand ±1·49*	*% roots Black Shank ± 6·16*	*infected by Nematodes ± 5·19*
t_1 ...	59·5	347	92·0	64·9	80·3
t_2 ...	64·7	358	93·4	68·5	76·4
t_3 ...	66·2	351	95·1	71·0	80·6
t_4 ...	57·7	355	93·2	69·4	80·8
t_5 ...	67·7	335	94·6	69·7	81·5
Mean	63·2	349	93·7	68·7	79·9
±	2·09	± 6·65	± 0·69	± 2·76	± 2·32

There is no significant difference between treatments.

The land had been under sugar cane from 1949–53 and contained a high amount of organic matter. This may be one reason why the application of manure did not affect yield and grade indices.

An interesting result is that contrary to what is commonly believed, application of manure does not seem to increase the incidence of Black Shank disease nor the infection of roots by nematodes.

Other types of tobacco.—A number of air-cured and fire-cured varieties have been introduced during the last five years. Some of them have considerably improved through selection.

Among the Burley varieties, Maryland and White Burley have given good yields and fairly good colour of leaf but they are still outyielded by the established variety Amarello.

Rg. a cigar wrapper variety, and Usikappal, the Indian cheroot variety, have done well and further trials will be carried ont. The varieties of Western, imported from Nyasaland and Tanganyika in 1951 are still susceptible to Black Shank. in spite of repeated selection.

A number of air-cured varieties were obtained for experimental purposes from Dr. Bulsonov of the Austrain Tobacco Monopoly. Some Burley and cigar varieties are promising.

Curing experiments.—A new method of flue-curing described by Stephen, Ivan Neas and Hunter in the June issue of Rhodesian Tobacco was tried at Richelieu. As a result of a number of experiments carried out in special "humidity cabinets" at Trelawney, the authors state that barn spot development can be held to a minimum by doing the initial yellowing at 100–102° F. with 100 per cent humidity and thereafter raising the temperature so long as the wet bulb does not exceed 100–102° F.

Two experiments were carried out in which the barns were filled with leaf heavily spotted with frog eye. Water was sprayed in the barns, at the initial stages, to keep the atmosphere saturated and the ventilators were kept closed.

The spots on the leaf enlarged to some extent during the time required to bring the temperature to 100° F.; thereafter the development of the spots was checked during the yellowing and fixing of the leaf. The consumption of firewood was 1¼ cords, compared to 2 cords or more for previous curings.

10. Rodrigues

General.—Climatic conditions on the whole were not very favourable to agriculture. Rainfall was below average in January and February whereas June was exceedingly wet.

The "New Zealand" maize variety is becoming more popular with peasant farmers and is consistently outyielding the variety known as " local maize ".

The acreage under foodcrops such as cassava, maize and sweet potatoes increased throughout the island during the year.

Fields of beans, peas and onions were destroyed by the heavy rains in June and had to be replanted.

A few peasants resumed tobacco cultivation late in the year and it is encouraging to note that the quality of leaf sent to Mauritius was above that obtained in the past.

Several demonstration plots were laid down all over the island. As a result, cultivators are showing growing interest in the use of artificial fertilizers, a practice almost unknown in the dependency. A large number of planters visited the station to obtain advice on various agricultural problems.

On 11th March, the annual livestock census was made, giving the following results :—

	1951	*1952*	*1953*	*1954*
Cattle	4,963	5,235	5,504	5,430
Sheep	3,180	3,842	4,080	2,657
Goats	5,016	4,837	3,956	3,206
Pigs	3,395	3,198	2,856	2,916

The drop in sheep, goat and pig numbers is due to greater exports to Mauritius.

Experimental Station

New quarters for the Agricultural Instructor were completed at La Ferme and a number of huts erected. The offices at headquarters have been rebuilt.

Fertilizer trials with maize were repeated and yields of 1,240 kilogs of grain per acre were obtained when a complete fertilizer mixture was given as compared to 726 kilogs per acre without any fertilizer.

A varied set of experiments with Cassava, sweet potatoes, yams, potato, groundnuts, tobacco and a number of other crops plants was carried out. Various fodder grasses have been established in observation plots.

Tea seeds were received from Mauritius and the first seedlings are being raised.

Various vegetables were grown at the Station for seed production and yield trials and the fruit section has been enriched by the addition of a large number of fruit trees.

The livestock at the station was maintained, generally, in good health.

Soil and water conservation

230 acres of land were contoured during the year with dry stone walls 2½ feet high by 3 feet wide at the base and 2½ feet at the top. The total area of arable land protected by stone terracing is now 980 acres.

A new dam was built across Oyster Bay River in February. There are now 76 dams in the dependency and they all resisted the June floods.

11. Extension Service

(*a*) *Policy*

The major form of activity of the Service has been to maintain close contact with farmers with a view to advising them on improved methods and techniques of growing sugarcane, foodcrops and vegetables. With regard to sugarcane, the activity of the Service was mainly concentrated on farmers growing less than 100 acres, the Mauritius Sugar Industry Research Institute being responsible for advisory work among estates and planters of larger areas.

(*b*) *Demonstration work*

Twenty-five sugarcane demonstration plots were harvested under the control of the Extension Officers · nine plots were harvested by their respective owners. Five more plots were released from control having been under observation for four successive crops.

The use of phosphatic fertilizers has given remarkable results with sugarcane, the yields in most cases having increased by 2½ to 7 tons per acre, as a result of phosphate applications.

Many cases of severe potash deficiency were discovered which were unsuspected of the farmers who were using only nitrogenous fertilizers. Special demonstrations were carried out for the benefit of these planters ; they were also given the necessary advice and practical assistance.

As a general rule, when demonstration plots showed marked visible response to the treatments recommended, farmers of the neighbouring regions were invited to visit them and see for themselves the beneficial effects of the treatments applied.

Thirty-four demonstration plots were laid out on foodcrops and vegetables on farmers' fields. Of these 14 were harvested during the year ; 11 were still in progress and 9 plots were discarded for various reasons. On the average, marked increases in yield have resulted from the application of complete fertilizers as compared with the unbalanced or inadequate fertilizers that the farmers generally employ. Numerous demonstrations in the farmers' own fields have been conducted on the use of fungicides, insecticides and weed killers.

Sixty-eight demonstrations with chemical weed-killers were effected on small sugarcane planters land. This practice of protecting the crop is gradually developing among farmers, more rapid progress being at present limited by shortage of spraying equipment. One of the objectiyes of the Service is to encourage Co-operative Credit Societies to purchase sprayers for the use of their members and other planters of the region who may be desirous of hiring the equipment. Not much progress has yet been made in this connection, but the idea is gaining ground although a little slowly.

Much progress has been observed in the treatment ot cane setts with fungicides. A large number of planters were supplied with the chemicals at cost price by the Service.

A new foodcrop and vegetable demonstration plot was created on grounds of the War Department at Vacoas. It is serving a useful purpose being right in the middle of a large foodcrop and vegetable production centre.

(c) *Propagation work*

Seventeen sugarcane variety propagation plots laid out on private-owned lands in 1953 for the multiplication of the three newly released Barbados varieties were havested in 1954. The crops were disposed of by the owners of the land mainly as seed material either for themselves and for neighbouring growers.

Distribution of the Barbados varieties, B. 3337, B. 3716 and B. 3717 was continued. There were two main distributing centres : one at Saint Antoine Sugar Estate and the other at the Richelieu Experiment Station. 51,000 canes were distributed. Another lot of 15,000 canes were distributed free to small planters for the establishment of 24 new propagation plots.

(d) *Prohibited cane varieties*

It was rather difficult to assess the exact acreage still covered by Co. 301 (Uba seedlings) in the Union Flacq and Constance Factory areas. Regular plantations of that variety are not longer made but a fairly large number of stools of that variety were found in some planters' fields. They had not been reaped but left over to be up-rooted after the crop season. To set a good example to planters of the locality, the managers of Union Flacq and Constance Sugar Estates also did not harvest several thousand tons of canes of that variety which were uprooted.

(e) *Foliar Diagnosis*

Planters were kept informed of the advantage they can derive from the use of the foliar diagnosis technique as a means of ascertaining the nutritional requirements of their sugarcane crop in so far as phosphate and potash are concerned. Lectures were delivered on the subject in the course of meetings, and samples were forwarded to the Mauritius Sugar Industry Research Institute for analysis by arrangement. 200 samples were taken from fields where deficiencies were suspected to occur. 87 of these showed cases of phosphate deficiency, 30 showed cases of potash deficiency. The planters concerned were advised to adjust their fertilizer programme accordingly.

(f) *Small Planters' meetings*

Over one hundred meetings were held with planters during the intercrop season. The main topics discussed were :—

(*a*) mechanical cultivation
(*b*) planting time as influenced by climatic conditions and localities
(*c*) selection of seed material and seed dressing practices
(*d*) use of complete fertilizers
(*e*) use of weedkillers
(*f*) foliar diagnosis as a means of assessing nutritional requirements
(*g*) protection of crops against pests and diseases.

These topics constitute the subject matter of discussions in which the planters are encouraged to exchange their views under the guidance of the extension officers.

(g) *Pests and Diseases*

Extension officers were active in assisting farmers to detect the occurrence of pests and diseases affecting their crops and to apply the necessary treatments. 17,000 visits were made in the fields for that purpose and more than 1,000 acres of various crops, mostly vegetables and foodcrops were treated with the assistance of the Service. With the not-so-well organised foodcrop growers, more direct assistance is given in the form of loans of spraying equipment. The 700 cases of such assistance during the year indicate that planters are now showing practical interest in the protection of the crops which not so long ago never received any attention of that sort at all. In December, the discovery of a sugarcane disease new to Mauritius was made by one of the Extension officers on varieties B. 3337 and B. 3716 at Tamarind Falls Estate. The disease was later diagnosed as Red Stripe Disease. It was subsequently found on the same varieties in two other places, namely, Gower and Bois Cheri (Moka).

(h) *Miscellaneous*

1. A survey was made to assess the extent of the damage caused to vegetable and foodcrops as a result of the application of volatile weed killers to neighbouring sugarcane fields.

2. Assessment of rentals of lands leased by the Mauritius Railways for agricultural purposes was made by the Service.

3. Extension officers attended weekly team meetings of the Social Welfare Department at various centres throughout the year in an advisory capacity.

12. Land Settlement

Petit Sable Smallholding Scheme

Almost all of the minor faults in the buildings which could be improved upon, have been remedied and the scheme in so far as buildings are concerned is complete except for the erection of the estate building and pit latrines which according to the original plan of the scheme were to be erected. The metalling of the road giving access to the additional holdings brought under cultivation on the upper part of the Settlement at Grand Sable has been completed. To assist in the prevention of soil erosion some seven acres of steep slopes at Grand Sable were planted to filao and Araucaria trees, the latter was given a trial on the advice of the Conservator of Forests. Anti-erosion works including erection of stone walls have been started on the allotments.

At Petit Sable tree planting on the steep slopes has not been a success ; 25 per cent of the trees died due to water-logged conditions over part of the area, it is not proposed to replant this area as in time of heavy rainfall the same damage might recur. It was thought advisable to encourage more sugar cane growing on the steeper slopes of the holdings. Consequently the area under cane of each holding has been increased from 62'5 per cent to 75 per cent of the total area of the holding.

Good crops have been obtained throughout the scheme and tenants have obtained profitable returns from sugar cane and food crops ; their financial position may be considered as satisfactory. The onion crop was a success, and disease and pest attacks on the seedlings have been kept under control by frequent spraying following the advice given to the growers by the officers of the Extension Service.

A few settlers are keeping cows and the majority are looking forward to do so when they get the necessary capital for the purchase of animals. Small stock, like goats and poultry are being kept by all the settlers. With a view to improving the local breed of goat kept by the tenants, arrangements were made with the Livestock Husbandry division for the loan of an Anglo-nubian buck.

Richelieu

The ten dwelling houses on the residential holdings, and the other buildings including the cowsheds have been erected. Certain minor faults in the buildings have still to be remedied and it is hoped that these works will be completed shortly. Tenants were notified that they should occupy their houses as from 1st November, 1954, date from which rent for the buildings would be charged.

The construction of the irrigation canal for the utilization of the existing reservoir on the scheme has been completed; water is being supplied to the non-residential tenants. The installation of the domestic water supply has been completed by the Public Works Department.

Good crops have been obtained throughout the scheme. Potato crops were successful and the yields quite satisfactory ; prices however, were rather on the low side. Cane has been planted by some tenants and the whole area is being satisfactorily cultivated.

Terre Rouge

Delivery of the houses and outbuildings has been made by the Contractor. The works have not been executed to complete satisfaction. The Contractor has been requested to remedy all the defects and in case of non-fulfilment of the conditions of the contract, the work will be undertaken by this Department and charged against the monies still due to him.

The construction of the main irrigation water supply canal is progressing satisfactorily and it will reach the settlement early next year. The additional surveyor appointed for the laying out of the distributory network of irrigation water on the scheme has started work and he will be in a position to submit his report early next year.

Some 10,000 feet of road works have been completed.

Sugar cane, ground nuts and tomatoes were the main crops grown. In most cases the yields were poor as a result of the prevailing dry conditions. Tenants are complaining about the delay in getting Irrigation water supply and have put forward a request to pay a reduced rent so long as irrigation water will not be available. Residential tenants are reluctant to come and live in their houses as long as irrigation water is not available.

PALMAR

The ten dwelling houses on the residential holdings and the other buildings including the cowsheds for six cows have been erected. Some minor defects in the buildings have to be remedied. Tenants have been notified that they should occupy their houses as from 1st December, 1954 date from which rent for the buildings would be charged.

The Public Works Department have completed the installation of the domestic water supply for the residential holdings and water is now flowing in the unique fountain that could be erected on the site. Tenants have been doing fairly well with their maize and tomato crops. One tenant who had the good fortune of holding a permit for tobacco growing had a very fine crop.

13. Allotments

The Allotment Relief Scheme continued to be administered pending Government's decision as to future policy. The departmental committee in charge of allotments met three times during the year. The total number of allottees was two hundred. One lessee was evicted for neglect of his land and another gave up his plot voluntarily.

14. Miscellaneous

The Agricultural Division contributed to a local annual Exhibition held at the Curepipe Town Hall, the theme of which this year was mainly agricultural. Commercial production of vegetable seeds was illustrated by means of seeds samples, germination tests and photographs showing the quality of the vegetables obtained from the seed of the acclimatised varieties.

In the foodcrop section samples of potatoes, groundnuts, maize, yams and other produce obtained from the experimental plots of the Division were on show. Photographs illustrated the benefits obtained through the use of chemical fertilizers and fungicides, control of weeds by herbicides, experiments on fodder crops and mechanization of the main cultural operations at the agricultural stations.

Bales of hay made with chopped cane tops, elephant grass and molasses grass, together with tables showing the feeding value of the hay, were also on show.

In a small pavilion, the technique of plant propagation using improved compost and soil blocks was demonstrated.

Attendance was high, the visitors showing keen interest in the agricultural and other exhibits.

Lectures on agricultural subjects were given by various members of the staff to the students of the College of Agriculture.

15. Revenue

The revenue derived from sale of crops, plants and seeds from the various sections of the Division amounted to Rs 88,067.60 during the financial year 1953–54, being made up as follows :—

	Rs.	*c.*
Sale of potatoes	26,571	96
,, ornamental and useful plants ...	14,362	35
,, vegetable seeds	8,979	50
,, tobacco leaf	18,091	84
,, tobacco seedlings	253	50
,, canes	15,152	34
,, cane cuttings	1,451	46
,, other produce	3,204	65
TOTAL ...	88,067	60

16. Acknowledgement

It is my pleasant duty to place on record my deep appreciation of the assistance I have received throughout the year from all the officers of the Division.

ROBERT ANTOINE,
Senior Agricultural Officer.

NOTE.—The section on the Extension Service was prepared by Mr. A. d'Emmerez de Charmoy, M.B.E., Senior Agricultural Officer (Extension), that on Land Settlement by Mr. I. Fakim, Acting Land Utilization Officer.

College of Agriculture

1. Composition of the College Advisory Board for 1955

The Director of Agriculture—*Chairman.*

The Principal, College of Agriculture—*Vice-Chairman.*

Members.—The Honourable Dr. E. Millien. M.L.C., Liaison Officer for Agriculture.

Messrs. L. Baissac, M.B.E.

P. G. Anthony

Raymond Hein

Maurice Martin

Francis North Coombes

P. O. Wiehe

Pierre de Sornay, Chevalier de la Légion d'Honneur.

Nine meetings were held during the year under review.

2. Staff

Mr. J. Dupont de Rivalz de Saint Antoine, B.S., Lecturer in Sugar Technology and Engineering was transferred to the Central Board in June 1954 and replaced by Mr. A. E. Rouillard, M.S.

The post of lecturer in Agricultural Science is still vacant. Lectures are delivered on a part-time basis, thanks to the help given by the Director of Agriculture who kindly allows his Senior Agricultural Officer to lecture at the College.

3. The College of Agriculture has now become an integral part of the Department of Agriculture, and, as such, no longer publishes a separate Annual Report. The present report is published with the annual report of the other divisions of the Department of Agriculture.

4. *Admission, Entrance Scholarships and Number of Students.*—23 candidates applied for admission to the College and sat for the entrance examinations held in April. Eleven of them satisfied the examiners and were admitted as full-time students for the normal three-year diploma course. Messrs. C. Carmagnole and M. Perombelon were awarded the entrance scholarships.

Two students who had failed at the annual examinations in 1953–54 repeated their first year.

The total number of students attending the diploma course during the year was 27 distributed as follows :—

Year	*No. of students*
1st	12
2nd	9
3rd	6

Seventeen other students made use of the laboratories of the College for practical work in connection with special studies.

Nine candidates applied for admission to the "Tropical Agriculture Course" and eight were accepted. One failed to register at the beginning of the year and two abandoned their studies after the first term.

Fifteen candidates applied for admission to the "Sugar Analysis Course" and 7 of them were accepted. One left after the second term.

5. *Term—Attendance—Conduct.*—The College year began on the 3rd May. The three terms were divided as follows :—

	Weeks
3rd May to 17th July 1954	11
13th September to 4th December, 1954 ...	12
12th January to 26th March, 1955	11
TOTAL ...	34

Attendance was regular. The conduct of students, particularly those of the 2nd year, was not as it should have been and they were severely dealt with, after which, normal good behaviour was restored.

6. *Results of Examination.*—The annual examinations were held between 12th and 23rd April, the results being as follows :—

FIRST YEAR

Twelve candidates sat for the examination. Seven passed and were admitted to the second year course. Two failed in two subjects and were referred. Two had to repeat their first year and one was asked to leave the College as he failed for the second time.

Second Year

Nine candidates sat for the examination. Six passed and were promoted to the third year ; one failed in one subject and was referred. One had to repeat his second year and the third one had to leave College as he had already failed in the 1st year and had had to repeat it.

Third Year

Six candidates sat for the examination ; all passed. Three were awarded the Honours Diploma and the three others got the Pass Diploma. The results were as follows :—

G. Bax—Honours Diploma	R. Bechet—Pass Diploma
P. de C. Le Merle—Honours Diploma	D. Hardy do.
S. Moutia—Honours Diploma	L. Thatcher do.

Mr. G. Bax and Mr. S. Moutia came out first and second with 75·1 per cent and 73·2 per cent respectively of the total of marks for the three years. They were both awarded the Scholarship of the College of Agriculture. Mr. Bax will study Mechanical Engineering (a 3-year course) at City and Guilds College, London. Mr. Moutia will take the B.Sc. Horticulture degree (London University). The duration of the course in his case is four years.

Eight candidates, six of them college graduates, sat for the City and Guilds Examination in sugar Manufacture in May 1955.

Six candidates passed. Five obtained a first class pass and one obtained a second class, namely :—

G. Bax First Class	P. de C. Le Merle First Class
R. Bechet First Class	S. Moutia First Class
D. Hardy First Class	L. Thatcher Second Class

Other Courses

Five candidates passed the examination for the Certificate in "Tropical Agriculture," a one-year course specially devised for practical agriculturists, namely : Messrs. H. Antelme, G. Robert, E. Martin, D. Harel and K. Kooraram.

Four candidates passed the examination for the Certificate in "Sugar Analysis," a new course started in January 1954, with the object of training persons to work as assistants to Sugar Estate Chemists, namely : Messrs : C. Babet, S. E. Patel, M. A. Baptiste and R. T. Hanoomansing.

7. *College Development.*—It was decided to employ the balance left from the College reserve fund after transfer of the College to Government to enlarge the existing college by the erection of a new building. This enlargement was calculated to cost Rs. 200,000 including the cost of new equipment for the existing laboratories. A firm of architects was entrusted with the task of preparing plans.

This enlargement was found to be necessary to meet the needs of the increasing number of students seeking admission to the College. A total number of twenty-five students admitted per year is expected to be sufficient to meet the needs of the Department of Agriculture, of the Sugar Industry and of the other Agricultural industries. It is hoped that in the near future, it will be possible to do for the minor industries what has already been done for the sugar industry and to provide fully trained and qualified personnel.

Space has been reserved in the new building for the creation of new Sugar Technology laboratories, new drawing room, lecture rooms and common room. The existing Biology laboratory will be enlarged to meet the coming needs.

8. *Cooperation with Réunion island.*—In August 1954, a party of three students from Réunion accompanied by Mr. R. Richard, Directeur de l'Ecole Agricole de Saint Joseph, Réunion, paid a visit to Mauritius. It lasted 10 days and in the course thereof, the Réunion students had the opportunity of seeing various aspects of our Agriculture and to discuss our problems.

In the same month, a party of 4 of our students went to Réunion and had the occasion of visiting the industries flourishing over there and which are unknown in Mauritius.

The assistance of the "Comité Permanent de Collaboration Agricole" in this connection is gratefully acknowledged.

9. *Prize Giving.*—The prize giving and presentation of diplomas ceremony was held at the College on the 23rd June, 1954. The following students were awarded prizes :—

R. Bathfield, R. Leclezio, C. Amide, S. Moutia, R. Bechet, F. Wiehe, E. Lincoln.

J. Rene Lagesse,
Principal, College of Agriculture

Tea Division

General

Tea production in the Colony has again increased and now exceeds 1,000,000 lb.; this is the ninth consecutive year of increased production. Plucking has commenced on the first area of tea planted at Midlands Tea Plantation.

The office of the Tea Division was transferred from Reduit, to a temporary Office at the Tea Experimental Station at the end of May, and to the new office building on the 16th October.

Staff

Mr. D.N. Andrews, Assistant Tea Officer has been in charge of the Division during the year, while the post of the Tea Officer remained vacant. Mr. R. B. J. Deane has been appointed Tea Officer and is expected to arrive in the Colony early in the new year.

Mr. G.H. Lallmahomed was appointed Superintendent of Tea Plantations and assumed duty on the 4th January.

Mr. M. Kadel assumed duties as clerk of the Division on 31st March to replace Mrs. O. Louise who was transferred to the Head Office.

Weather

The weather during the year has been very favourable for tea ; the fairly dry winter allowed planting to go ahead and the percentage of success in planting has been very much greater than in 1953.

Rainfall

	C. L. Wooton		Midlands	
	Inches	*Wet days*	*Inches*	*Wet days*
1951	174·56	268	102·18	175 (June–Dec.)
1952	159·21	286		
1953	156·94	282	187·81	303
1954	127·21	289	174·24	293

Production

The total production of tea for the year was 1,142,987 English lb. of black tea and 1,645 English lb. of green tea. This is an increase of 235,183 lb. of black tea and of 170 lb. of green tea over the preceding year, the increase is due partly to favourable weather conditions and partly to the coming into bearing of greater areas of the high yielding jat teas.

Production for the five tea factories during the last five years in English lb.

	1950	*1951*	*1952*	*1953*	*1954*
Bois Cheri	335,447	379,035	400,484	417,558	577,888
Corson	231,764	252,477	257,663	274,922	298,898
La Flora	74,640	110,690	131,828	132,377	160,838
Pont Colville	64,618	66,868	74,673	67,786	71,621
Nouvelle France ...	42,724	32,090	18,702	15,161	33,747
	749,193	851,160	883,350	907,804	1,142,987

Green Tea :—

	1950	*1951*	*1952*	*1953*	*1954*
R. Aubeeluck	3,972	4,238	2,542	1,473	1,643

Imports and Exports

Exports reached the record figure of 250,913 English lb.; of this figure 1,240 lb. were returned to the Colony due to damage to chests in transit, giving a final export figure of 249,637 lb. This is an increase of 159,811 lb. over the previous highest figure (1951—89,826 lb.). The greater part of the exports were manufactured by Bois Cheri Estates Ltd.

Imports show a decrease on the previous years probably due to the high prices ruling on the world markets.

Year	*Imports (including Green Tea) English lb.*	*Exports English lb.*
1950	86,849	47,986
1951	47,641	89,826
1952	94,822	16,035
1953	111,878	76,755
1954	36,080	249,673

Exports to :—

United Kingdom	161,457
South Africa	39,950
France	3,644
Holland...	41,190
Reunion...	3,432
TOTAL ...	249,673

Tea Factories

All the five factories have now been rebuilt and are completed except for Nouvelle France and Usine Corson where some work remains to be done in the fitting of tats in the withering lofts.

Year	*Area planted with tea and in bearing*			
	Permits issued		*Area planted*	
Up to and including	*Arpents*	*Acres*	*Arpents*	*Acres*
1953...	3,408·90	3,555·5	2,487	2,593·9
1954...	697·74	727·7	220	229·5
TOTAL ...	4,106·64	4,283·2	2,707	2,823·4

Area in bearing at 31st December, 1954 = 2,142 arpents (2,234 acres).

Tea Seed

1,000 lb of high jat seed was again imported by air freight from Lujeri Estates, Nyasaland, in March/April. The percentage of success this year with the germination of this seed was far greater than last year due to the drier conditions prevailing during the planting season.

3,023 kilos (6,666 lb) of tea seed were harvested from the seed bearers at Parc-aux-Cerfs ; of this, 1,904·5 kilos (4,199 lb) were sold for Rs. 7,164.38 (£ 537.9.3 d).

Tea Committee

Nine (9) meetings were held during the year. Items discussed included : Tea Marketing Pool, Standardisation of the weights of packets of tea, Tea Export Quota.

Tea Experimental Station

C. L. WOOTON

1. Fields Nos. 1, 2, (Malayan jat) and 3 (selected local jat). These three fields completed their first cycle of bearing in June when they were pruned ; the yields obtained for their first two seasons were as follows :—

Field No.	*Area*	*Crop Green Leaf*	
		1952–53	*1953–54*
	Acres	*English lb.*	*English lb.*
1a ...	3·85	5,300	10,311
2 ...	4·58	14,522	20,933
3 ...	5·50	12,005	24,406
		31,827	55,650

All these fields were pruned in June at a height of 19", fertilizer—a mixture of N.P.K.—was applied at a rate of 500 lb. per acre in September—October ; they were tipped at 25" and brought into bearing in November.

2. Fields Nos. 4 (local jat) and 5a (selected local jat). These two fields completed their first season in bearing in June ; the yields obtained were :—

Field No.	*Area*	*Crop Green Leaf 1953–54*
	Acres	*English lb.*
4 ...	3·83	10,918
5a ..	11·32	28,622
		39,540

Both these fields had an application of fertilizer—a mixture of N.P.K. at a rate of 500 lb. per acre in September—October and are continuing in bearing for a further season.

3. The total crop of Green tea leaves harvested for the season 1953—54 was 86,537 half kilos (95,389 lb. which was sold by contract to Bois Chéri Estates for Rs 28,557.21 (£ 2,142.6.6d.)

4. Field No. 5b (Nyasaland jat) was cut across in May, given an application of 500 lb. of fertilizer—a mixture of N. P. K.—in September, tipped and brought into bearing in November.

This gives a total of 34.24 acres now in bearing from which 28,910 half kilos (31,867 lb.) of green tea have been gathered so far this season (1st July to 31st December).

5. Field No. 5c (Malayan jat) and 6 (Nyasaland jat and Malayan Jat), These fields which are now nearly two years old have made good growth, the plants were pegged down in February—March to promote bushy growth, the vacancies have been supplied, and the green cover of *Tephrosia Candida* was lopped and the loppings forked into the ground at the same time as a fertilizer mixture at the rate of 500 lb. of N. P. K. per acre was applied in October.

6. Field No. 7a (Nyasaland jat) and 7b (Malayan jat) were planted with seed at stake during April—June. The percentage of success has been much greater this year than last, as the weather has been more favourable. An application of 250 lb. of N. P. K. per acre was made in October, *Tephrosia Candida* has been interplanted as a ground cover and green manure.

7. The clearing of Fields Nos. 8 and 9 is proceeding ready for planting in 1955.

8. An experiment was carried out in the nursery to determine whether the application of superphosphate has any beneficial effect on young tea. Superphosphate was applied at 3 rates : $\frac{1}{2}$ oz., $\frac{1}{4}$ oz., $\frac{1}{8}$ oz., per plant ; after six months no very appreciable benefit could be noted.

9. During the year, one Overseer's house and four labourers' quarters were built and are now occupied.

Midlands Tea Plantations

1. Field No. 1 (Nyasaland jat). This field which is nearly 3 years old is now in bearing. In March–April, the ground cover and green manure crop of *Tephrosia Candida* was uprooted and thatched on the ground to provide a mulch. In May–June, the tea bushes were cut across at 18" high, fertilizer—a mixture of N.P.K. at the rate of 500 lb. per acre was applied in September when the bushes were given a first tipping ; a second tipping followed in October and the bushes are now in bearing. The yield of green leaves to date has been 6,859 half kilos (7,560 lb).

2. Field No. 2a (Nyasaland jat) and 2b (Malayan jat). In February–March, the one year old plants were pegged down to encourage a bushy growth. Seed from the interplanted *Tephrosia Candida* and *Crotalaria Grahimina* was collected for further planting. Field 2a was supplied with vegetative propagation material, a total of over 10,000 plants being supplied. Both fields had an application of 500 lb. of fertilizer per acre (N.P.K. mixture) in September–October and at the same time the green manure crops were lopped and the loppings buried.

3. Field No. 3 (Nyasaland jat) and 4 (Malayan jat). These two fields were planted with seed at stake in the period April–June. Field No. 3 has been planted on the hedge pattern with wide rows between the hedges to allow of the possible use of mechanical means of cultivation. The percentage of success in this year's planting has been remarkably high due to the dryish winter period.

These two fields have been given an application of a mixture of N.P.K. fertilizer at the rate of 250 lb. per acre. *Tephrosia Candida* has also been interplanted as a green manure and cover crop.

4. Clearing has started ready for the 1955 planting; to date about 60 acres have been cleared and ripped by the Mechanical Unit.

5. Labourers' quarters—Work has been nearly completed on the 8 labourers' quarters and the Overseer's house on which work was commenced in the financial year 1953–54. Preparations are under way for the erection of a further 20 labourers' quarters and another Overseer's house.

Seed Bearers

1. The seed bearers at Parc-aux-Cerfs (Malayan jat 9 acres) yielded as already stated 6,666 lb of seed. They are in very good condition, though one or two cases of *Armallaria Mellea* have been found, the diseased trees in each case have been removed and burnt.

2. The 3 acres of seed bearers at Midlands (Nyasaland jat) are making good growth and a few lb of seed will be harvested next year.

All the seed bearers were given an application of ½ lb of a mixture of N.P.K. fertilizer per tree in October.

3. Together with 1,000 lb of tea seed imported from Nyasaland this year, we were sent a present of 30 lb of seed of a special "Assam jat" which Lujeri Estate had raised; part of this seed was planted in Field No. 7 and about 2 acres have been planted as seed bearers at the Agricultural Experimental Station, Curepipe.

Leguminous plants

A small supply of seed of *Stylosanthes Gracilis* (Brazilian Lucerne), a creeping plant used in Ceylon and India as a ground cover in tea, was obtained; this has been planted at both the Tea Experimental Station and Midlands as has also some seed of Fleminga, a plant rather like *Tephrosia Candida* but more upright; both these seeds were obtained from Madagascar.

Pests and Diseases

No new pests or diseases have been noted, the estates have been remarkably healthy apart from occasional cases of *Armallaria Mellea*.

D. Andrews,
Acting Tea Officer.

Livestock Division—A. Veterinary Section

Staff

Mrs. G. V. Harmer, N.D.D., joined the Veterinary Division as Scientific Assistant, in November 1954.

Mr. F. Nadeau, Stock Inspector, left for England on leave on 21st July 1954.

Disease Control

Tuberculosis.—A campaign for the control of bovine tuberculosis by means of tuberculin testing and elimination of reactors has been carried out. The incidence in head cattle has appreciably diminished but still amounted to 14 per cent of the 1,483 animals tested. Out of 257 dairy cows tested 28 reacted. It is hoped that with future campaigns elimination of tuberculosis from herbs will take place.

Contagious Abortion.—No cases were recorded at the Government Dairy where the S. 19 vaccination is still the method of control.

Deficiency Diseases.—The main ones attended were still hypocalcaemia and avitaminosis-D. There were also a few cases of mineral deficiencies in cattle and sheep.

Internal and External Parasites.—The routine curative treatment continues to be carried out mainly against the stomach wire worms and the nostril fly of sheep and goats. Results obtained were very satisfactory.

Poultry Diseases.—Newcastle Disease virus was isolated in an epizootic amongst poultry at Black River, and the disease soon became widely distributed on the island. Extensive experiments were carried out at the Bacteriological Laboratory and an isolated virus was found to be identical to the Madagascar strain. A vaccine was received at our request from the Institute Pasteur de Tananarive, and vaccination was performed on a large number of birds and the results were highly satisfactory. The Institute Pasteur very kindly sent 125,000 doses of vaccine and a very great number of fowls were vaccinated with excellent resuts. Experiments are still being carried out to find how long the immunity lasts. In the near future, the vaccine will be produced locally.

Fowl Pox vaccination is still done on a very big scale with nearly 100 per cent protection.

Due to this epizootic of Newcastle Disease which took such a heavy toll of our birds, the Poultry Improvement Scheme of exchanging White Leghorn Cockerels for scrub ones, had to be abandoned

Artificial Insemination

Over 7,000 cows were inseminated during the year, and the rate of conception was very satisfactory.

Sterility Control

The main cause of sterility is still ovarian cysts and enucleation gives very good results.

General Veterinary Assistance

More than 15,000 calls from breeders for treatment of different ailments were attended.

Veterinary Education

Lectures were given at the Agricultural College to 2nd Year Students, and to those attending the Tropical Agriculture Course.

Quarantine

The number of dogs quarantined at the Government Kennels for six months, amounted to seven.

Slaughter houses and meat Inspection

Inspections of Slaughter Houses were made as usual. The control of dairy animals for slaughter is still in force. Lectures in meat inspection were given to about 50 sanitary inspectors.

B. Animal Husbandry Section

Animal Husbandry Competitions

Small cow-breeders were invited to compete in the exhibitions organised by the Extension Service. Exhibits were judged " in the shed. " The entries were numerous and prizes were given in the form of calves, sheep and goats from the Government Breeding Centre at Palmar.

Improvement of Dairy Cattle

Milk surveys were conducted throughout the island to determine the yield of peasant-owned Creole cows. With a view to improving the breed, the best producers were chosen so that use might be made of their progeny in building up a selected herd. Over 100 cows have been found with a maximum daily yield of 12 kilos. The average daily milk yield per cow is 4·93 kilos, and the total for an average lactation of 201 days is 991 kilos.

Improvement of Milk Production

In order to improve the milk yield of peasant-owned cows, the Extension Service resorted to a propaganda campaign for better feeding. As a result forty-one tons of a Government Maize Mill mixture were sold to the cow-owners through shopkeepers. It is hoped that cow-owners will make further use of this facility, but it appears however that the limiting factor is relatively high cost of the mixture. Steps are being taken for the Maize Mill to produce a balanced food mixture containing ureated molasses at a cheaper price.

Creole Dairy Cattle

Nineteen more females were brought from Indian peasants and added to the herd, bringing the total up to forty-three cows and heifers. The average daily production per animal in milk (22 in all stages of lactation) is now 7.6 kilos or 16.72 lb.

Four young Creole bulls, one bred by the Department and the remainder purchased in the field were used to inseminate the selected cows in the progeny tests. A further four (of which three have been bred by the Department) are entering the tests.

All three new byres at the Palmar Stock Breeding Centre are completed and occupied, and a milk room, an office and a feed room have also been built, and are now in use.

Government Dairy Herd, Curepipe

As will be seen from the table below, although production of females in milk remains practically the same as last year there were fewer cows in milk, with the consequent drop in total milk production for the herd. This is accounted for by the fact that the calving rate fell from 64 per cent to 60 per cent, only four out of the thirteen Friesians in the herd having calved. The conception for the remainder of the herd was 70 per cent. This sudden decline in the fertility of the Friesians is being investigated :—

	1953	*1954*
Average number of females in milk	45	35
Total milk produced by the herd	126,386 kgs (27,188 gals)	99,643 kgs (21,435 gals)
Average output per lactating cow	2,832 kgs (609 gals)	2,847 kgs (613 gals)
Average daily yield per lactating cow	7·76 kgs	7·93 kgs

Zebu Cattle

The Ongole herd has increased by five births.

Sheep and Goats

Although there were signs of Oestrus ovis infestation amongst them none of the cases proved fatal. The health of the adult stock was on the whole good, but a number of kids and lambs died soon after birth.

Pilot haymaking Scheme at Plaisance

The experiments which were started by the Animal Husbandry Officer are now being continued by the Agricultural Division.

ANTOINE DARNÉ,
Senior Veterinary Officer.

Plant Pathology Division

Staff

The Division continued to work under reduced staff, no appointment having been made to the post of Assistant Plant Pathologist.

Diseases of the Sugarcane

Chlorotic streak.—The disease continued to be important chiefly in the elevated regions of the island. The hot water treatment of cuttings at 52° C. for 20 minutes has been adopted by most estates for large-scale field work and is giving satisfaction.

Sclerospora disease.—A few cases of the new Sclerospora disease reported for the first time in Mauritius last year, were detected by officers of the Mauritius Sugar Industry Research Institute on the E 1/37 cane on an Estate in Moka district.

Ratoon stunting disease.—It was stated in last year's report that preliminary investigations into the possibility of the existence of ratoon stunting disease in the Colony were started towards the end of that year. First-year seedling canes, which had been treated against chlorotic streak by treatment with hot water, was inoculated by immersion into a maceration in water of crushed tissues of suspected diseased canes. Growth was slow for various reasons and after eight months, a few of the shoots which had made sufficient growth were cut and examined. They exhibited the red fibres at the nodes, characteristic of ratoon stunting disease, thus definitely proving the existence of the disease in the island.

In September, Mr. H. Barat, the Director of the "Laboratoire de Pathologie Végétale" in Tananarive, having stopped for a few days in Mauritius on his return journey from a visit in Australia, was requested to examine the canes in the experimental plot referred to. Mr. Barat stated without hesitation that the symptons exhibited by the inoculated canes were characteristic of ratoon stunting disease.

A campaign against the disease has been launched by the Mauritius Sugar Industry Research Institute.

Red Stripe.—On the 16th of December, specimens of diseased canes were brought to the laboratory by the Acting Senior Demonstration Officer from Tamarind Falls, a small estate in Plaines Wilhems district. The disease had all the characteristics of red stripe.

The estate is situated in a wooded part of the island, a good distance from neighbouring sugarcane lands. Cultivation of the sugarcane had been discontinued for a very long period on the estate, but had been resumed about three years ago. The attack of the new disease was severe on B. 3337 and B. 37161, two Barbados canes which had been planted four months previously on an area of about 3 acres. The other varieties present on the estate are M. 134/32, M. 423/41, M. 165/38 and E. 1/37.

The Barbados canes had been introduced from Trinidad in 1945. They had been kept for two generations in the cane quarantine green house, where they were under weekly observation by three officers of the Department, viz., the plant Pathologist, the Entomologist, and the Plant Breeder of the former Sugarcane Research Station. After their release from quarantine, they had been further kept under occasional observation in the experimental plots of the department on sugar estates in various parts of the Island. It is not considered that such a spectacular disease as red stripe could have escaped attention during the whole time the canes had been under observation, had the disease been introduced along with the imported canes.

Again, the diseased canes on the estate had come from cuttings supplied by the Richelieu Experiment Station, where the disease had not been previously observed, and a survey made subsequently did not reveal its presence at that station.

The possibility for the disease to exist on some wild grass on the estate was therefore considered, and a survey of the diseased field on December 24th revealed the presence of two grasses with necrotic stripes on the leaves, namely *Paspalum nutans* Lam. and the *Paspalum paniculatum* L. The former grass was seen rather commonly affected in the vicinity of the diseased field, the attack upon it culminating into the death of many of the affected shoots.

Inoculations into spindles of Barbados canes at the Central Experiment Station, with macerations of crushed diseased sugarcane and *P. nutans* leaves resulted in the production of the red stripes in both cases. The pathogen has been isolated from both sugarcane and *P. nutans*, and cross-inoculation with the cultures obtained have been positive.

Root disease.—Root disease associated with *Pythium* sp. was recorded in ratoon 134/132 fields at Riche-en-Eau Sugar Estate in Grand Port district and at Bel Etang in Flacq.

Maize

Maize rust caused by *Puccinia polysora* Und. has been less severe this year, probably owing to drier conditions prevailing than in 1953.

The following rust-resistant varieties, in 2-oz. lots, were received from the Maize Rust Research Unit at Ibadan, Nigeria, towards the end of 1953 : Mexican 2, Mexican 7, Mexican 13, Mexican 16, Mexican 22, La Créole, White Tuxpan, Yellow Bounty and Sicaragua. A small plot of these varieties was planted at Reduit in January, with half the amount of seed received, in the fear of destruction by possible cyclones, the remainder being planted in April. Local and Rodrigues maize were also included in the plots. Inbreeding by the tassel-bagging method was carried out by the Agricultural Division, in view of obtaining larger supplies of the material received from Nigeria.

The plots, although of small size, were also used to obtain indications about the resistance of the imported varieties towards the rust under local conditions. As a result of the two trials, the following varieties showed promise of resistance : Mexican 7, 13 and 16.

This year, small supplies of two other varieties—Mexican 1 and 5—were received from Nigeria, and will be included in the subsequent tests to be made.

Some of the imported varieties seemed to show greater susceptibility to bacterial stem rot than the locally-grown variety.

Streak disease of maize was detected in small plots at the Richelieu Experiment Station.

Filao

A certain amount of research work was made on dying filao trees, *Casuarina equisetifolia* L. in the island, as there seems to be indications that the death of the trees would not be solely due to bacterial wilt caused by *Pseudomonas solanacearum* Sm. (Dowson). Two fungi were obtained frequently in culture, but failed to produce infection upon inoculation into young filao plants.

Other diseases recorded

On *Hymenaea* sp.—*Corticium salmonicolor* Berk. and Br. at Floreal :—

Peach.—Death of a few trees at Floreal, cause undetermined.

Letchi.—Death of branches and of a few trees at Vacoas, cause undetermined.

Tomato.—Bad attacks by *Phytophthora infestans* Mont. (de Bary) in certain fields at fruiting stage, at Vacoas and Rose-Hill.

Tobacco.—An undetermined disease, apparently of the virus type, in a field in Savanne district.

Leaf curl.—Few cases in Rivière du Rempart, Flacq and Plaines Wilhem districts.

Visits to Madagascar and Réunion

Madagascar.—In May, the Government of Mauritius was officially informed by the French Authorities in Madagascar of the recent discovery of Fiji disease in the Brickaville, Tamatave and Fenerive regions along the east coast of that country.

Owing to the frequent communications, chiefly by air, between Madagascar and Mauritius, permission was sought by the Mauritius Government for the Plant Pathologist to visit the affected area, and with the kind consent of the High Commissioner for the French Republic in Madagascar, the Plant Pathologist proceeded on June 20th to visit that island. The chief object of the visit was to determine the necessity of possible additional measures to be adopted for the protection of Mauritius.

The Plant Pathologist returned to Mauritius on 10th July, and presented a report on his mission, an abridgment of which was published in " La Revue Agricole de l'Ile Maurice " Volume XXXIII, 5, 1954 pp. 219–225.

Upon the invitation of Madagascar, a mission by sugarcane technologists of Mauritius and Reunion visited Madagascar in October; the visit had already been arranged in principle before the existence of Fiji disease had been discovered in Madagascar. The Plant Pathologist formed part of the Mauritius delegation and remained in Madagascar from October 5 to October 28.

The Fiji disease situation on the east coast of Madagascar was studied and inspections were also made of the sugar plantations of the west coast at Nossi-Bé, Ambanja, the Sosumav and Namakia. Visits were also paid to the " Station d'Essai de Ivoloina " and to the Experiment Stations of " Lac Alaotra " and Marovoay. Apart from a few cases of smut in the sugarcane nursery at " Lac Alaotra " and occasional cases of leaf scald at the other places mentioned, no important sugarcane disease was observed on the west coast.

Reunion

On his return journey to Mauritius after his second visit to Madagascar, the Plant Pathologist stopped in Reunion island from 28th October to 1st November at the request of the Director of the " Services Agricoles de la Reunion. " The object was to investigate the possible existence of ratoon stunting disease in that island.

The reaping season was, unfortunately, far advanced at the time, and few fields of tall canes could be inspected. However, symptoms suggesting ratoon stunting disease were observed on the variety Q. 50 at the " Station d'Essai du Syndicat des Fabricants de Sucre " at " La Bretagne. " Similar symptoms were also seen on an unknown sugarcane variety, possibly M. 131, in the vicinity of " Piton Saint Leu. " As, however, the Q. 50 cane has been stated in Australia not to show easily the symptoms of the disease, it was recommended that inoculation experiments on the lines described under ratoon stunting disease in this report should be carried out.

Talks on diseases

Short talks on the new Sclerospora disease of sugarcane and on Fiji disease were delivered to the Staff of the Mauritius Sugar Industry Research Institute on 4th March 1954 and 13th September 1954 respectively.

At the request of the Director of the "Laboratoire de Pathologie Vegetale" of Madagascar, a talk on Fiji disease was delivered to the sugarcane planters at the "Hall de l'Information" in Brickaville on 25th June, 1954.

Radio talks were delivered at the Mauritius Broadcasting Service on the following subjects :—

Fiji disease of sugarcane on 6th and 7th September, 1954.
Ratoon stunting disease of sugarcane on 27th and 28th September, 1954.

Publications

The note about the occurence of *Puccinia polysora* in the Indian Ocean area. mentioned in last year's report, was published in *Nature*, Volume 173, March 13, 1954, page 505.

Other publications made during the year :—

"La rouille du Maïs causée psr Puccinia polysora"

La Revue Agricole de l'Ile Maurice, XXXIII, 1, 1954, pp. 20—25.

Sclerospora disease of Sugarcane in Mauritius, Ibid, pp. 64—73

"La maladie de Fidji a Madagascar", Ibid, p. 123.

Fiji disease of sugarcane in Madagascar, Report on a mission (abridged), Ibid, pp. 219—225.

"La maladie du rabougrissement de la canne a sucre," Ibid, pp. 275—284,

Control of imported Plant Material

Cane quarantine greenhouse :—The varieties R. 366, R. 297, Pindar, Trojan, P. O. J. 3016 and B. 41227, which had been introduced from Reunion island in 1952, were released from the cane quarantine greenhouse in June. They were planted in the field at the Central Experiment Station, along with the standard variety M. 134/32, for further observation in the open, before definite release.

The following varieties were received during the year and are now growing in the quarantine greenhouse :—

(*a*) Q.44, Q. 47, Q. 57, 28 MQ 1370, 27 MQ 1124, U.S. 48—34 and E.P.C 39—393 from Australia

(*b*) Co. 779 and Co. 911 from Coimbatore

(*c*) Pepe Cuca, B. 4362, H. 37—1933, N. Co. 310 and PR 1000 from U.S.A.

Plant Inspection at the Harbour and Airport

The control of the import of plants and plant parts continued as usual.

In view of the danger which the existence of Fiji disease of sugarcane in Madagascar constitutes for Mauritius. additional security measures have been taken at the Harbour and Airport, as set forth in the Report on the Plant Pathologist's mission to Madagascar already mentioned.

Acknowledgements

Opportunity is taken to render warm thanks to :—

(*a*) The High Commissioner of the French Republic in Madagascar

(*b*) The Secretary to the High Commissioner

(*c*) The Agricultural and Civil Authorities of the island

(*d*) The Chairman and Members of the Chamber of Commerce at Tamatave and Majunga

(*e*) The Sugarcane planters of the East and West Coasts of Madagascar

(*f*) The Director and Staff of the "Services Agricoles de la Réunion" for their attention, courtesy and help in all directions during the visits paid to Madagascar and Reunion.

G. Orian,
Plant Pathologist.

Entomological Division

1. Staff

The Associate Entomologist returned from overseas leave on May 14th while the Assistant Entomologist left for similar leave on the same date and was away for the rest of the year.

2. Sugar-cane

Chlorotic Streak Disease :—The method of natural transmission of this virus disease from diseased to healthy plants is unknown but suspicion is naturally directed towards sap-sucking insects which feed either habitually or occasionally upon sugarcane. Investigations to discover the means of transmission were begun in 1953 and they were continued throughout the year, for considerable importance is now attached to the disease in the areas of higher rainfall and on heavy water retaining soils. The work has consisted of attempts to experimentally transmit the disease through the agency of insects, recording insects which feed on plants which may be alternate hosts of the virus, and field trials laid down with the co-operation of the Sugar Industry Research Institute to assess the rapidity of natural infection and the conditions under which it occurs.

Attempts to infect healthy plants grown from hot water treated cuttings (50°C. for 20 minutes) with insects collected of diseased plants in the field or with insects first confined with diseased plants in the laboratory have been unsuccessful despite the use of various techniques. The following insects have been used in these experiments—*Fulmekiola serrata* (Kob.), *Longiunguis sacchari* (Zehnt.), *Peregrinus maidus* (Ashm.), *Perkinsiella saccharicida* Kirk., and *Dicranotropis muiri* Kirk.

The results from the field trials are not yet available, but certain data have already been obtained upon the rapidity with which healthy plants grown from hot water treated cuttings acquire disease symptoms.

Leaf streaks closely resembling those symptomatic of Chlorotic Streak Disease were found on *Pennisetum purpureum* in February for the first time.

The white grub, Clemora smithi (Arr.)—Two randomised block trials were laid down in November which is the beginning of the adult season, to assess the efficacy of Chlordane. The insecticide was used as an emulsion and applied at rates of 3 lb and 6 lb per arpent with watering-cans. In one trial

application was made to the open furrows prior to planting the cuttings and in the other along the rows of recently cut ratoon cane. In addition, 3 arpents in a field of young virgin cane and a similar area in a field of ratoon cane was treated with the emulsion at the rate of 4 lbs per arpent by spraying generally over the soil surface.

A simple method of estimating the white grub populations in cane fields was elaborated and described in the March-April issue of *La Revue Agricole de l'Ile Maurice.*

The spotted borer, Poceras sacchariphagus Boj.—Further consignments of parasites of *Diatraea* spp. were received by air from the Trinidad substation of the Commonwealth Institute of Biological Control for trial against *P. sacchariphagus.* These are summerised as follows :—

	No. of consignments	*Approx. No. parasites sent*	*Number obtained alive*	*Number released*
Spilochalcis dux Wlk ...	3	40	23	23
Prophanurus alecto Craw. ...	9	6,360	970	927
Stomatodexia diadema Wied ...	2	106	12	0
Apantelcs diatraeae Mues ...	5	2,700	739	673
Palpozenillia palpalis Aldr ...	3	1,200	see text	

Considerable difficulty has been experienced in obtaining *Prophanurus alecto* owing to mortality of these delicate insects in transit. Consignments received in previous years were complete failures owing to this factor but this year a few comparatively successful consigments enable the release of an appreciable number of these parasites.

The few *Stomatodexia diadema* obtained alive were retained for an attempt to breed the insect but all died without mating.

Consignments of *Apanteles diatraeae* and *Palpozenillia palpalis* were received in December and work with these species was continuing at the end of the year. Nearly 300 *Palpozenillia* had been released up to that time.

Other work upon the spotted borer during the year involved examination of cane at factories to assess the intensity of field damage and collection of data upon varietal resistance to attack.

A paper upon the life cycle of *P. sacchariphagus* and the other cane moth borers was published in the May-June issue of *La Revue Agricole de l'Ile Maurice.*

The pink borer, Sesamia calamistis Hamps.—Twenty seven batches of larvae were collected at intervals throughout the year from the Rose-Belle—Britannia area to obtain a rough idea of the incidence of *Apanteles sesamiae Cam.*, the parasite which was introduced in 1952. The following data which were obtained show that *A. sesamiae* is very common and must be an important factor in the bionomics of this pest :—

Month	*Number of larvae collected*	*% parasitised by A. sesamiae*
January	476	24·4
March	44	29·5
May	207	15·9
June	310	12·6
July	266	19·5
August	60	31·6
November	92	18·5
December	255	23·9

Leafhoppers.—The recent discovery of Fiji Disease of Sugarcane in Madagascar has focussed attention upon *Perkinsiella saccharicida* Kirk., which is a well known vector of the disease. This Delphacid leafhopper has long been present in Mauritius, never sufficiently abundant to be a pest in its own right, but its potential importance is now considerable and information about its bionomics in the island has become desirable. Work to this end has been initiated.

While studying *Perkinsiella*, Delphacid not previously known to exist in Mauritius was recorded upon sugarcane. It has been identified as *Dicranotropis muiri* Kirkaldy and it oviposits and develops on sugarcane in a manner similar to that of *Perkinsiella*. The insect was also collected upon sugarcane in Réunion island and at several places in Madagascar by the writer when visiting these countries during the year.

3. General

Pests of the Pigeon Pea (Cajanus cajan).—Collections of *Etiella zinckenella* Tr. and *Maruca testulalis* Gey., the major pests of the pigeon pea, were made to determine if any of the parasite introductions described in last year's report had given results. Of the six parasitic species introduced, one was found to have become well established; this is the undetermined *Microbracon* sp. which was numerous in several localities upon Etiella. It does not apparently attack *Maruca*.

The common yellow mealybug, Icerya seychellarum Westw.—Cryptochaetum monophlebi Skuse (Agromyzidae), which was introduced from Madagascar against *I. seychellarum*, was found to be very abundant in several localities. Collections were made in these localities for release elsewhere.

Mites.—The Associate Entomologist on his return from leave resumed his studies on mites of agricultural importance with particular attention to the *Tetranychus* sp. attacking tomatoes and other *Solanaceae*, and the coconut mite, *Raoellia indica* Hirst. A preliminary spraying experiment indicated that a combined Chloricide—Katakilla (Derris) spray will give good results against *Tetranychus*.

The coccinellids *Stethorus jejunus* Casey and *S. picipes* Casey, introduced in 1950 and 1952 respectively, were not found during searches for predators of the tomato mite although the local species, *S. vinsoni* Kap., was common.

4. Miscellaneous

(*a*) Two consignments of the wasp *Scolia oryctophaga* Coq., comprising 830 females and 38 males, were sent by the air to Fiji in August—September. They were required by the government of Fiji for use against the rhinoceros beetle, *Oryctes rhinoceros* L.

(*b*) Lectures in Agricultural Entomology were delivered as usual at the College of Agriculture by the Entomologist.

(*c*) The Entomologist visited Reunion island in June under the Mauritius —Reunion scheme of agricultural co-operation to study certain aspects of the cane moth borer problem in the island. He also spent two weeks in Madagascar with the Plant Pathologist and the Director of the Mauritius Sugar Industry Research Institute when a tour was made of the sugar growing areas and the agricultural experiment stations of the island.

(*d*) The Assistant Entomologist, while on leave, represented the colony at the 6th Commonwealth Entomological Conference held at London in July.

5. Publications

The following papers were published during the year by officers of the division :—

Williams, J.R. (1954)—The biological control of weeds. Rept. 6th Comm. Ent. Conference, Comm. Inst. Ent., Lond., pp.

Williams, J.R. (1954)—Estimating the larval populations of *Clemora Smithi* in sugarcane fields. Rev. agric. Maurice, *33* (2), pp. 74—77, 2 graphs.

Williams, J.R. and Moutia, L.A. (1954)—Some aspect of sugarcane entomology in Mauritius. Proc. Int. Soc. Sugarcane Tech., 8, pp. 570—573.

Williams, J.R. and Mamet, R. (1954)—Insects and other invertebrates which feed upon sugarcane in Mauritius and Reunion, and their natural enemies. Bull. Dep. Agric., No. 89,19 pp. 73 refs.

Moutia, L.A. (1954)—Notes sur le cycle biologique de trois lepidopteres nuisibles a la canne à sucre à Maurice. Rev. agric. Maurice, 33 (3), pp. 116—122.

J.R. Williams,
Entomologist.

Chemical Division

Staff

The chemist acted as chairman of the the Sugar Industry Rehabilitation Fund.

Mr. F. Berchon, Assistant Chemist, returned from overseas leave on 17th March 1954.

Soil Survey of Rodrigues Island

The investigation of the mechanical and chemical composition of soils of Rodrigues island was continued. Twenty five samples of soil and subsoil from fifteen different localities were analysed.

A table showing the location and characteristics of the various samples as drawn by Mr. Craig, former Deputy Director, is annexed.

From the figures obtained, and when compared to Mauritius soils, and judging from the combined water, the Rodrigues soil appears to have a low degree of laterisation.

The organic matter is generally low and it shows a close C/N ratio indicating that it has undergone much decomposition.

The P_2O_5 soluble in strong HCl is rather low but that determined by Truog's method shows a greater availability than in normal Mauritius soils.

On the whole Rodrigues soils are well provided with K_2O and the exchangeable K_2O figures are in general higher than those of Mauritius.

The average soil reaction is PH 6·5—this is ideal for most crops.

These results and the results of analysis already published in annual reports of 1952 and 1953 represent a comprehensive survey and should provide a good picture of the soil properties of Rodrigues.

Moisture content of Midland soils

At the request of the Director of Public Works and in connection with the design of the Midlands dam, the examination of soils for the determination of moisture was continued. 30 samples were analysed and the following results were obtained :—

	Original samples Moisture on air dry Basis	*Air dried samples Moisture on oven dry Basis*
Highest figure ...	45·28	7·56
Lowest figure ...	25·00	3·43

Phosphatic Guano

Two samples of Phosphatic rocks from Serpent Island were analysed and the following results were obtained :—

	1	*2*
Phospheric acid % ...	6·77	10·54
Calcium oxide % ...	0·34	2·6

50 per cent of the Calcium Oxide is present as calcium carbonate ; the phosphoric acid is mainly present as aluminium and Ferric phosphate. These guanos are of no value for agricultural purposes.

Fodder Trials

Analyses in connection with fodder trials on local and imported grasses were performed for the Agricultural Division The results were as follows :—

	Figures % Dry Matter								
	Moisture	*Ash*	*Fibre*	*Protein*	*Ether Extract*	*Carbohydrates*	P_2O_5	K_2O	*Cao*
Panicum maximum ...	81·0	7·42	38·39	11·44	·45	42·30	·42	1·58	·38
Setaria kazungula ...	75·0	10·69	36·64	4·76	1·02	46·89	·31	1·02	·22
Elephant grass	73·0	14·00	38·62	7·87	1·14	38·87	·34	1·30	·41
Cenchrus ciliaris ...	75·0	6·18	34·98	8·19	1·37	49·28	·38	1·64	·50
Chloris Teso	76·5	5·29	37·15	6·75	·91	49·90	·36	1·30	·59
Herbe d'Argent	76·5	6·24	34·37	6·12	1·15	52·12	·35	1·24	·41
Australian paspalum ...	78·5	5·58	28·42	9·06	1·58	55·36	·38	1·13	·41
Chloris gayana	80·0	6·14	34·30	9·44	·79	49·33	·39	1·13	·48
Panicum sp.	82·0	8·51	32·20	12·62	·79	45·88	·44	2·94	·19
Akaroa Cocksfoot ...	81·0	22·80	27·35	10·31	2·64	36·90	·64	4·07	traces
Kikuyu	77·5	4·20	28·81	19·56	1·01	56·42	·45	1·64	·19
Setaria of Bua River ...	81·0	4·91	40·50	6·00	·90	47·69	·32	1·53	·26
Panicum makarikari ...	77·0	4·80	28·94	7·62	1·38	57·26	·33	·79	·38
Paspalum notatum ...	81·0	12·45	22·29	9·00	1·18	55·08	·66	1·47	·67
Paspalum paniculatum ...	78·0	5·64	32·32	8·31	·68	53·05	·67	2·37	·39
Phalaris tuberosa ...	85·0	8·79	24·81	19·94	2·00	44·46	·68	2·60	·74
Molasses grass	79·0	4·21	31·13	14·50	1·05	49·11	·47	1·19	·34

Ensilage

Two samples of silage prepared from cane tops and maize tops were forwarded by the Agricultural Division for analysis. The followfng figures were obtained :—

	Cane Top	*Maize Top*
Moisture %	72·5	71·5
	Composition % Dry Matter	
Ash	9·95	14·53
Total protein	4·09	7·34
Crude Fibre	29·05	32·72
Ether extract	1·46	1·26
Carbohydrates	55,45	44·15
Volatile organic acid (expressed as Acetic acid) ...	0·71	1·3
Non volatile organic acids (expressed as Lactic acid)	7·09	5·07
Ameno acids (expressed as crude proteins)	0·15	0·89
Volatile bases (expressed as crude proteins)	0·25	0·91
True proteins	2·98	5·69

The information derived from above data may be summarised as follows :—

(*a*) The amount of non volatile organic acids is largely in excess of the volatile organic acids which shows that the fermentation has proceeded normally.

(*b*) However the protein breakdown into simple products of the amino acid type has not proceeded to a great extent during the ensilage

Hay

Sample of hay prepared by the agricultural division from the following plant material viz :—

(*a*) Cane Tops

(*b*) Kikuyu grass

(*c*) Molasses grass

(*d*) Petite Fataque

were analysed with the following results :—

	Cane tops %	*Kikuyu grass* %	*Molasses grass* %	*Petite Fataque* %
Moisture	11·00	32·00	13·00	13·0
Ash	7·85	8·93	8·69	13·41
Fibre	30·79	23·22	32·42	30·79
Proteins	3·37	2·19	4·62	5·12
Fat	1·28	0·77	1·82	1·60
Carbohydrates	45·71	32·89	39·45	36·08
	100·00	100·00	100·00	100·00
Starch equivalent	38·0	25·0	36·0	33·9
Nutritive ratio	1: 16·3	1: 16·5	1: 10	1: 10·2

Sand

At the request of the Board of Agriculture, Fisheries and Natural Resources, a survey of crown lands, Pas Geometriques and privately owned estates alongside Pas Geometriques was undertaken in order to ascertain the possibility of opening inland sand quarries to meet the requirement of sand of the Colony for building and other purposes with a view to eliminating or at least minimising the damage done to the beaches of the Colony by the exploitation of sand quarries along the coast.

Sand samples from the following quarries were analysed and the results are tabulated below :—

Depth	*% carbonate expressed as Calcium Carbonate*		
	Belle Mare	*Palmar*	*Solitude*
2'	89·0	—	94·6
3'	92·5	93·9	90·2
4'	93·9	92·1	94·4
5'	92·4	92·9	96·1
6'	92·9	90·6	91·9
7'	93·2	—	—
8'	92·3	—	—

Fish Farming

A fish farming scheme was started at Belle Rive, at the request of the Conservator of Forests, samples of water were collected from the feeding stream and from the pond containing Tilapia Melanopleura for analysis. The following figures were recorded :—

	Feeding Stream	*Pond*
Temperature	23° C	23° C
pH	5·6	6·4
Dissolved oxygen p. p.m ...	6	8·8
Alkalinity as $CaCo_3$ p p.m ...	2·78	8·35
Chloride p. p.m	20·6	19·8
Sulphate p. p.m	6·5	4·9
Nitrate p. p.m	nil	nil
Total iron as Fe_2O_3 p. p.m ...	3·7	4·0
Calcium as Ca0 p. p.m ...	3·4	2·8
Magnesium as Mg0 p. p.m ...	8·0	16·4
Phosphate p. p.m	nil	nil

Milk

The quarterly analyses of samples of milk from the Government Dairy was performed as usual. The average figures were satisfactory :—

	Total solids %	*Fat* %
Morning ...	12·04	3·45
Evening ...	12·98	4·35

The series of individual tests to determine the variations in the butter fat contents of cows of Friesland ascendency and of local breed were continued.

Routine analysis

288 samples were received involving 433 determinations. The research work included the analysis of 120 samples, 761 estimations being carried out.

The preparation and standardisation of acids and alkalis solutions for estates was carried on as usual.

F. Berchon,
Acting Chemist.

Sample	Location	Soil/Subsoil	Use	Depth	Colour	Rocky/Not Rocky	Texture	Remarks
A	Baie Topaze	Soil	Cynodon Plain	8″	Reddish Brown	Terre Franche	Good Crumb	Fair number of rocks on surface. Several areas of few arpents, slight slope
B	Baie Topaze	Subsoil	do.	6″	Red	do.	Compact, flaky	Underlying sample A
C	Cascade Jean-Louis	Soil	Cynodon Just clear	10″	Brown	do.	Good Crumb	Just cleared, chiendent starting growth, gentle slope, but erodable protection needed
D	do.	Subsoil	do.	6″	do.	do.	Very hard, flaky	—
E	Reposoir	Soil	Cultivated	8″	Chocolate	No stones	Very good crumb	Situated in hollow, fairly near edge of marsh. No chiendent
F	do.	Subsoil	do.	6″	Yellowish Brown with white concretions	do.	Hard	Colour changed on exposure
G	Rivière Coco	Soil	Not cultivated, under gazon	12″	Brown	Free from stones and gravel	Good crumb structure	Sample taken near football ground on flats at valley bottom. An excellent soil
H	do.	Subsoil	do.	6″	do.	Fair number of small hard stones	Good, similar to soil, but more compact	—
J	Head of valley Papaye, near junction of road from Coco with road to Cascade Jean-Louis	Soil (if such)	Cultivated	3″	Greyish with yellow cut	Some weathered rocks	Bad	It is real soil, or just pure subsoil. This land should certainly be thrown out of cultivation
K	Under J	Subsoil	do.	4″	Chocolate milked	do.	Very bad	—
L	Oyster Bay	Soil	Coconut plant	10″	Brown	Small flinty stones	Good crumb	Valley bottom. Covered with gazon (as at Riv. Coco). Only real visible difference is in hardness
M	do.	Subsoil	do.	6″	do.	do.	do.	—
N	Gabriel	Soil	Manioc planted	6″	do.	Terre franche	do.	Land not protected at head of Rivière Raffin on other side of watershed from Oyster Bay Riv.
O	do.	Subsoil	—	10″	do.	No stones and gravel	Hard, flaky compact	—
P	Pavillon	Soil	Cultivated	3–4″	Greyish, dry, brown, moist	Few small stones	Good crumb	Upper part Anse Baleine Rivière southern slope of watershed—not protected
Q	do.	Subsoil	do.	9″	Greyish Brown	Free from stones	Hard and flaky	Northern slope of watershed, 100 feet from top

Sample	*Location*	*Soil/Subsoil*	*Use*	*Depth*	*Colour*	*Rocky/Not Rocky*	*Texture*	*Remarks*
R	l'Union	Soil	Cultivated	5″	Brown	Some stones and gravel	Good crumb structure	Fair slope, not protected
	do.	Subsoil	do.	7″	Reddish Brown	Some stones	Compact and sticky	There had been some rain
T	Canne Paul	Soil	Cultivated	9″	do.	Terre franche	Compact good structure	Many rocks on surface. On road to Port Sud-Est just below where anti-erosion walls stop.
U	do.	Subsoil	do.	5″	Reddish Brown with greyish concretions	do.	Very hard	Worms seen in sub-soil
V	Anse Baleine	Soil	Not cultivated	10″	Brown	Some large stones, few small	Good crumb	Valley bottom, ½ mile from sea—well wooded—l'herbe noire, petit acacia, etc. growing
W	Decidee, facing St. Francois	Soil	Cultivated	9–10″	Brown	Some small stones	Very hard Good crumb	Situated on not too steep slopes, which had been partially protected, by wall not along contour. This had evidently been part of acacia belt, many stumps remaining.
X	Decidee, under W	Subsoil	—	5″	Reddish Brown	Some stones	Hard, compact and flaky	—
Y	Nouvelle Decouverte	Soil	Cultivated	10″	Brown with reddish tinge	No stones	Good crumb structure	Land situated near bottom of depression surrounded by gentle slopes, except at head, where slopes steep but under trees and Furcraea.
	do.	Subsoil	—	5″	Reddish Brown	No stones	Compact and flaky	—

NOTES :—

1. All these samples are spot samples.

2. All the soils in Rodrigues visited by me are mature soils. Erosion has taken place and some of the samples, especially those taken in valley bottoms must be—at least to some extent—alluvial in origin, having originated in the adjoining hill slopes. It may be that some of these valley bottom soils are subject to occasional flooding, but not in my opinion sufficient to eliminate them from consideration for any scheme of development.

3. The soils on the two upraised coral beaches at Pointe Corail and at Trou d'Argent were not sampled, as they could not conceivably be of any agricultural value. These soils are extremely thin and exist merely as packets in depressions. These soils can only carry their present sparse cover of grass, plus a certain amount of tree growth at Pointe Corail.

4. In certain places, where I tried to take soil samples, e.g. on the higher slopes of Riviere Coco, all the surface soil had disappeared due to erosion and the land had been abandoned. No samples in such areas were taken. There are fairly extensive areas like this—or areas which will soon become so,

Soils from Rodrigues

Mechanical Analysis

	Baie Topaze		Cascade Jean Louis		Reposoir		Rivière Coco	
	Soil (A)	Subsoil (B)	Soil (C)	Subsoil (D)	Soil (E)	Subsoil (F)	Soil (G)	Subsoil (H)
Stones and Gravel	17·9	30·8	1.7	Nil	2·1	8·7	0·9	17·7
Coarse sand	4·92	1·81	2·96	1·06	3·20	2·72	3·21	7·16
Fine sand	21·63	8·48	31·23	30·69	20·51	16·75	20·13	20·45
Silt	17·93	14·04	29·77	32·10	27·28	26·88	32·57	24·02
Clay	47·09	77·30	31·81	39·53	39·77	50·99	40·98	41·56
Organic matter	7·24	2·99	3·05	0·60	7·36	2·38	4·14	1·87
Loss by solution	2·66	1·22	1·96	1·55	0.36	0·73	0·14	1·97
TOTAL ...	101·47	105·84	100·78	105·53	98·48	100·45	101·17	97·03

Chemical analysis

Combined water	7·67	10·06	8·13	9·93	9·62	8·76	8·02	3·70
Organic carbon	4·20	1·73	1·77	0·35	4·27	1·38	2·40	1·09
Nitrogen	0·46	0·124	0·160	0·049	0·462	0·144	0·232	0·113
C/N Ratio	9·9 : 1	14·0 : 1	11·0 : 1	7·1 : 1	9·2 : 1	9·6 : 1	10·3 : 1	9·6 : 1
$P_2 0_5$ soluble in strong H Cl	0·118	0·146	0·198	0·164	0·237	0·160	0·287	0·266
$K_2 0$ do.	0·222	0·063	0·193	0·134	0·156	0·090	0·117	0·107
$P_2 0_5$ by Truog's Method...	0·0101	0·0071	0·0099	Trace	0·0051	0·0031	0·0140	0·0124
Exchangeable $K_2 0$	0·0346	0·0388	0·0620	0·0346	0·0802	0·0221	0·0702	0·0283
pH	6·5	6·4	6·7	6·6	6·4	6.7	6·4	6·7

Mechanical Analysis

	Head of Valley Papaye, near junction road from Coco to Road to Cascade Jean-Louis		*Oyster Bay*		*Gabriel*		*Pavillon*	
	Soil (if such) (*J*)	*Subsoil (under J)* (*K*)	*Soil* (*L*)	*Subsoil* (*M*)	*Soil* (*N*)	*Subsoil* (*O*)	*Soil* (*P*)	*Subsoil* (*Q*)
Stones and Gravel	*Nil*	*Nil*	16·1	19·2	*Nil*	*Nil*	6·1	*Nil*
Coarse sand	1·06	3·80	11·03	10·46	2·02	1·61	3·15	0·36
Fine sand	30·22	28·50	20·42	22·43	12·96	11·87	29·01	28·64
Silt	33·44	32·95	32·17	30·09	22·57	23·75	24·93	30·98
Clay	38·28	41·57	40·14	41·02	54·96	57·89	36·79	37·45
Organic matter	2·02	1·14	2·49	0·94	5·44	2·72	3·57	0·61
Loss by solution	0·93	0·48	1·05	0·99	2·59	2·49	2·91	2·53
TOTAL ...	105·95	108·44	107·29	105·93	100·54	100·33	100·36	100·57

Chemical Analysis

Combined water	9·41	4·92	7·86	4·91	9·68	4·29	3·28	10·72
Organic carbon	1·17	0·67	1·43	0·55	3·16	1·58	2·07	0·36
Nitrogen	0·100	0·053	0·162	0·11	0·21	0·153	0·183	0·105
G/N Ratio	11·7: 1	12·6: 1	8·8: 1	5: 1	15: 1	10·3: 1	11·3: 1	3·1: 1
P_2O_5 soluble in strong H Cl	0·167	0·162	0·206	0·113	0·137	0·199	0·259	0·069
K_2O do. do.	0·256	0.211	0·223	0·174	0·086	0·063	0·235	0·208
P_2O_5 by Truog's method	0·0176	0·0160	0·0253	0·0261	0·0134	0·0113	0·0149	0·0210
Exchangeable K_2O	0·0795	0·0595	0·0904	0·0602	0·0161	0·0138	0·0793	0·1370
pH	6·6	6·5	6·4	6·6	6·2	6·0	6·5	6·4

Mechanical Analysis

	L'Union		*Canne Paul*		*Anse Baleine*	*Décidée (facing St. François*		*Nouvelle Découverte*	
	Soil (*R*)	*Subsoil* (*S*)	*Soil* (*T*)	*Subsoil* (*U*)	*Soil* (*V*)	*Soil* (*W*)	*Subsoil* (*X*)	*Soil* (*Y*)	*Subsoil* (*Z*)
Stones and gravel ...	25·2	17·1	16·2	8·35	2·0	15·3	12·7	*Nil*	*Nil*
Coarse sand	10·56	4·56	11·72	5·74	5·96	2·69	4·69	1·96	0·93
Fine sand	13·50	10·13	17·33	23·50	22·46	9·99	12·31	12·75	12·53
Silt	19·61	15·56	19·35	27·23	28·61	25·05	23·25	27·07	25·06
Clay	50·90	66·97	41·62	42·27	38·11	51·17	57·78	50·88	54·95
Organic matter	2·86	1·31	3·19	0·67	3·14	4·34	0·79	2·12	1·52
Loss by solution	2·40	1·34	3·33	2·08	4·69	5·02	3·55	3.57	2·57
TOTAL ...	99·83	99·87	96·54	103·49	106·97	98·26	102·37	98·35	97·56

Chemical Analysis

Combined water	11·62	12·72	8·86	9·66	11·57	9·05	13·52	12·49	13·06
Organic carbon	1·66	0·76	1·85	0·39	1·82	2·52	0·46	1·23	0·88
Nitrogen	0·239	0·151	0·221	0·097	0·255	0·147	0·113	0·174	0·162
C/N Ratio	6·9 : 1	5 : 1	8.4 : 1	4 : 1	7.1 : 1	17·1 : 1	4 : 1	7·1 : 1	5·4 : 1
P_2O_5 soluble in strong H Cl	0·126	0·155	0·157	0·193	0·231	0·287	0·109	0·303	0·347
K_2O ,, ,,	0·101	0·060	0·074	0·081	0.135	0·070	0·078	0·071	0·072
P_2O_5 by Truog's method ...	0·0188	0·0174	0·1376	0.1485	0·0407	0·0205	0·0234	0·0272	0·0264
Exchangeable K_2O ...	0·0361	0·0213	0·0354	0·0058	0·0470	0·0343	0·0233	0·0189	0·0076
pH	6·4	6·3	6·5	6·9	6·7	6·3	6·3	6·3	6·3

Engineering Division

Visits to Factories

The 27 sugar factories were visited during the year under review as well as the four distilleries which were operating.

Factory Date

The control of the working factories were carried out as usual. The data obtained show that the highest production by one factory amounted to 40,620 metric tons, the lowest 8,436 metric tons and the average 18,465 metric tons. Other results are shown in Table I.

TABLE I

AVERAGE CROP RESULTS—1949–1954

Year	*Sucrose % cane*	*Fibre % cane*	*Mill Extraction*	*Sucrose in Sugar % cane*	*Reduced B.H.P.*	*B.H.E.*	*No. of crushing hours/day*
1949	14·33	12·0	94·7	12·19	87·7	98·5	19·8
1950 ...	14·14	11·8	94·8	12·05	88·5	99·0	19·9
1951 ...	13·03	11·8	94·6	10·94	88·2	98·6	19·3
1952 ...	13·26	11·8	95·0	11·26	87·9	98·0	18·6
1953 ...	12·96	11·7	94·8	10·88	88·4	98·3	19·2
1954 ...	13·44	11·7	95·3	11·48	88·5	98·4	19·4

Investigations

(*a*) *Work on paper chromatography.*—During the crop work on paper chromatography was started.

The technique lies in placing a drop of the test solution on a filter paper strip at a point near the top end, the paper is then hung from a trough containing a suitable solvent or mixture of solvents into which the top end of the paper dips. The trough and the paper strip are enclosed in a chromatographic cabinet—an air tight compartment the interior of which is saturated with vapours of water and solvents. As the solvent is drawn into the paper by capillary forces and starts flowing vertically over the strip it extracts the individual constituents of the spot at different rates depending on the partition coefficients and other factors, carries down the strip to form a series of spots each containing a separate constituent and so effects the desired separation.

The strip is removed from the solvent trough, dried and then sprayed with suitable reagents to make the spots visible. By dividing the distance each substance moves by the distance moved by the solvent front on the chromatogram a constant known as the RF value is obtained. The constant is characteristic of the compound in a given solvent under standard conditions, and is also easily reproducible and can be used for the identification of the compound.

The preliminary work which was done included the separation of mixtures of sugars e.g. glucose, sucrose, and fructose, the separation and identification of the sugars contained in final molasses and the separation of the mixture of the organic acids tartaric, citric and malic. Further studies are under way.

(*b*) *The topping of sugarcanes.*—Work was done to determine the point at which it would be most economical to top the sugarcane.

Nine experiments were made on the variety M 134/32 by harvesting every cane in a stool, the number of stools chosen for one experiment varying from 6 to 9. The reference point selected was the point of attachment of the first partially green leaf to the cane stalk. The two nodes above that point, the surmounting white top, the three nodes below and the remainder of the cane were cut separately and the parts composited thus obtaining 7 different samples for one experiment. The weights of the composite samples were determined and the latter then crushed separately. Determinations of °Brix, Sucrose per cent and Purity were then made on the various juices obtained.

The value of sucrose lost and savings in cost of cutting, loading and transport were also calculated in relation to the point of topping. The results of the experiments made showed that normally the cane should be cut just above the reference point of attachment mentioned above. It might be economical in certain particular cases to cut slightly higher but in no case should the topping be higher than three nodes above the point of attachment of the first green leaf as top part of the cane representing 12·2 per cent of the total cane (leaves excluded) has a purity of less than 30°. A separate paper will be published on this subject.

(c) *Study of a new method for determination of calcium and magnesium in cane juices.*—This method which has found a general application in water analysis is now being applied in the sugar industry for rapid and accurate determinations of calcium and magnesium in cane juices and is superseding the former and less accurate soap solution method. The new method involves the use of :—

(i) a complex organic compound commonly known as versenate (ethylene—diamine—tetra—acetic acid) which forms an undissociated complex with calcium and magnesium.

(ii) indicators having specific colours with calcium and magnesium salts. After careful study of the method, and its applications it was recommended and explained to the Technical staff of several sugar factories. From the reports obtained the method has been applied to mixed and defecated juices. It has given satisfactory results, and has been of great help towards solving certain manufacturing problems.

Alcohol

No alcohol was exported to the United Kingdom during the year but a new small market was found in Hong Kong to which 11,000 litres of 94° G.L. alcohol were shipped. It is expected however that when the facilities for the bulk shipment of alchool are completed the British Market will be again open to us.

By the end of the year only three distilleries were running. Eight samples were analysed and graded.

Aloe Fibre

Experimental Fibre Decortication Station

Retting test carried out at the station indicate that retting rate increases with temperature up to a maximum of 36° C. The optimum pH is around 4.5. Recycling of the retting medium is not advisable as apart from its deleterious effect on the colour of the product, and accumulation of the acid produced it inhibits the retting process. Washing of fibre prior to retting gives a whiter fibre but retards retting.

Vegetable wax was extracted from dried aloe residue. Recovery was 4 per cent with petrol and 7 per cent with 94° alcohol as solvent. The product was of a dark green colour.

A new leaf feeder is being built at the station for use with the diffierent types of existing decorticators. It is expected to be completely automatic and to have a capacity appreciably greater than that of existing feeders.

New Decorticators

The new version of the Humbert Decorticator which was meant to be wholly automatic had to be rendered semi automatic. The leaves are now fed automatically to the first scraper by means of a rope and wheel system but the tip ends have to be fed by hand to a second decorticator. Industrial loss is around 10 per cent.

The Koenig Jaw Feeder at Grand-River-North-West is now giving full satisfaction. Industrial loss on a Raspador fitted with it is similar to that of a hand fed machine but 5 percent fibre is lost in undecorticated butts.

Four Pastor feeders have been put into use by the industry. These are slightly modified versions of the Koenig feeder.

Manufacture of Animal Feeding Stuff

463,981 tons of animal feeding stuff were manufactured at Richelieu during the year using the following raw materials Wheat Bran, Maize flour, Poonac, flour sweeping, fish meal, Molascuit, calcium carbonate and salt. The Porteus cubing and pelleting machine erected inside the mill had a few trial runs and the products were satisfactory. Owing to structural modifications to the mill under way full scale production has not yet started.

Yeast Tablets

11,040,000 Food Yeast Tablets were made from South African yeast and sold to Government Departments and the public.

Richelieu Maize Mill

Manufacturing account of Yeast Factory for the year ending 30th June, 1954

Dr.			***Cr.***		
	Rs.	c.		Rs.	c.
To cost of Yeast Powder ...	21,825	92	By cost of production transferred to Trading account ...	48,089	31
To wages and bonus	23,342	53			
To electricity	1,176	86			
To coal	1,744	00			
TOTAL ...	48,089	31	TOTAL ...	48,089	31

Trading account as at 30th June, 1954

	Rs.	c.		Rs.	c.
To cost of production from Manufacturing account ...	48,089	31	By sales of tablets to particulars	1,652	50
To stock of Yeast tablets on 1.7.53	7,967	00	By sales to Government Departments	85,825	00
To gross profit to Profit and Loss account	74,478	19	By stock of tablets on 30.6.54	43,057	00
TOTAL ...	130,534	50	TOTAL ...	130,534	50

Profit and Loss account as at 30th June, 1954

	Rs. c.		Rs. c.
To refund on contract tickets ...	148 75	By gross profit from Trading account	74,478 19
To railway	173 41		
To aggregates	450 00		
To stores	3,097 00		
To planks, timber etc.	835 60		
To petty expenses	443 07		
To Crown Agents	1,839 84		
To salaries of staff Rs. 2,195.00			
To net profit ... 65,295.52			
	67,490 52		
TOTAL ...	74,478 19	TOTAL ...	74,478 19

Statement of Maize processed during the financial year ending 30th June, 1954.

	Kilos	*Kilos*	*Kilos*
RECEIVING DEPARTMENT :—			
Stock on 1.7.53	nil	—	—
Purchases	297,685	297,685	—
To Drying Department	7,755	—	—
To Dry Maize Store...	289,930	—	297,685
		297,685	297,685
DRYING DEPARTMENT :—			
From Receiving Department	7,755	7,755	—
To Dry Maize Store	7,473	—	—
Loss through evaporation	282	—	7,755
		7,755	7,755
DRY MAIZE STORE :—			
Stock on 1.7.53	5,705	—	—
From Receiving Department ...	289,930	—	—
From Drying Department ...	7,473	303,108	—
To milling Department	274,123	—	—
Balance on 30.6.54	28,985	—	303,108
		303,108	303,108
MILLING DEPARTMENT :—			
From Dry Maize Store	274,123	274,123	—
To Ground Maize Store :			
Rice	106,850	—	—
Bran	53,610	—	—
Flour	109,360	—	269,820
Industrial loss	—	—	4,303
		274,123	274,123
GROUND MAIZE STORE :—	*Rice*	*Bran*	*Flour*
Stock on 1.7.53	—	—	47,425
From Milling Department ...	106.850	53,610	109.360
	106,850	53,610	156,785
To Mixing Department (Animal Feeding Stuff)	600	19,350	49,375
Sales	3,700	—	23,228
Balance Stock on 30.6.54 ...	102,550	34,260	84,182
TOTAL ...	106,850	53,610	156,785

Statement of "Animal Feeding Stuff" processed during the financial year ending 30th June, 1954.

	Kilos	Kilos	Kilos
RECEIVING DEPARTMENT :—			
Stock on 1.7.53 :—			
Molasses	23,308	—	—
Bagassillo	19,027	—	—
Groundnut Cakes	57,037	—	—
Wheat Bran	274,510	—	—
Cotton seed cakes	66,075	—	—
Flour sweeping	2,345	442,302	—
PURCHASES :—			
Molasses	110,250	—	—
Bagassillo	19,166	—	—
Flour sweeping	19,335	—	—
Poonac	10,000	—	—
Calcium Carbonate	1,400	—	—
Colonial Salt	1,000	—	—
Fish Meal	12,000	173,151	—
Dry Blood received	—	255	—
TO MILLING DEPARTMENT :—			
Poonac	10,000	—	—
Groundnut cakes	49,430	—	—
Cotton Seed Cakes	49,105	—	108,535
STACK LOSS :—			
Cotton Seed Cakes	—	—	700
TO MIXING DEPARTMENT :—			
Wheat Bran	91,550	—	—
Flour Sweeping	10,570	—	—
Colonial Salt	805	—	—
Fish Meal	8,030	—	—
Calcium Carbonate	1,040	—	—
Molasses	9,000	—	—
Bagassillo	1,800	—	122,975
STACK LOSS :—			
Flour sweeping	—	—	45
TO MOLASCUIT MIXING DEPARTMENT:—			
Molasses	67,100	—	—
Bagassillo	15,250	—	—
Wheat Bran	24,650	—	107,000
STACK LOSS :—			
Bagassillo	—	—	20,618
TO BLOOD MIXING DEPARTMENF :—			
Blood	255	—	—
Bagassillo	525	—	—
Wheat Bran	70	—	850
SALES :—			
Molasses	13,761	—	13,761
BALANCE OF STOCK ON 30.6.54 :—			
Molasses	43,697	—	—
Flour sweeping	10,885	—	—
Fish Meal	3,970	—	—
Calcium Carbonate	360	—	—
Colonial Salt	195	—	—
Groundnut Cakes	7,607	—	—
Wheat Bran	158,240	—	—
Cotton seed cakes	16,270	—	241,224
		615,708	615,708

Statement of "Animal Feeding Staff" processed during the financial year ending 30th June, 1954.—continued

	Kilos	Kilos	Kilos
MILLING DEPARTMENT:—			
From Receiving Department:			
Poonac	10,000	—	—
Groundnut cakes	49,430	—	—
Cotton seed cakes	49,105	108,535	—
TO FLOUR STORE:—			
Poonac Flour	9,920	—	—
Groundnut Cake Flour	48,350	—	—
Cotton Seed Cake Flour	48,450	—	106,720
Industrial Loss	—	—	1,815
		108,535	108,535
MOLASCUIT MIXING DEPARTMENT:—			
From Receiving Department:—			
Molasses	67,100	—	—
Bagassilo	15,250	—	—
Wheat Bran	24,650	107,000	—
TO MOLASCUIT DEPARTMENT:—			
Molascuit and Brancuit recovered	—	—	107,000
		107,000	107,000
MOLASCUIT DEPARTMENT:—			
From Molascuit Mixing Department:—			
Molascuit and Brancuit	107,000	—	—
Balance of stock on 1.7.53 ...	2,700	109,700	—
To Mixing Department	102,525	—	—
Balance of stock on 30.6.54 ...	7,175	—	109,700
		109,700	109,700
BLOOD MIXING DEPARTMENT:—			
From Receiving Department:—			
Blood	255	—	—
Bagassilo	525	—	—
Wheat Bran	70	850	—
TO MIXING DEPARTMENT:—			
Dry Blood Mixture	—	—	850
		850	850

Statement of "Animal Feeding Stuff" processed during the financial year ending 30th June, 1954—continued

	Kilos	Kilos	Kilos
FLOUR STORE:—			
Stock on 1.7.53:—			
Beans Flour	4,630	—	—
Poonac Flour	20,324	—	—
Groundnut Flour	4,945	—	—
Cotton seed cake flour	28,050	57,949	—
FROM MILLING DEPARTMENT:—			
Poonac Flour	9,920	—	—
Groundnut Cake flour	48,350	—	—
Cotton seed cake flour	48,450	106,720	—
TO MIXING DEPARTMENT:—			
Beans Flour	4,600	—	—
Poonac Flour	25,490	—	—
Groundnut Cake Flour	34,350	—	—
Cotton Seed Cake Flour	51,585	—	116,025
STACK LOSS :—			
Beans Flour			30
Sales :—			
Groundnut Cake Flour	12,000	—	—
Poonac Flour	150	—	12,150
BALANCE OF STOCK ON 30.6.54 :—			
Poonac Flour	4,604	—	—
Groundnut Cake Flour	6,945	—	—
Cotton Seed Cake Flour	24,915	—	36,464
		164,669	164,669
MIXING DEPARTMENT :—			
From Maize Department :—			
Maize Flour	49,375	—	—
Maize Bran	19,350	—	—
Maize Rice	600	69,325	—
FROM RECEIVING DEPARTMENT :—			
Wheat Bran	91,550	—	—
Flour sweeping	10,750	—	—
Colonial Salt	805	—	—
Fish Meal	8,030	—	—
Calcium Carbonate	1,040	—	—
Molasses	9,000	—	—
Bagassilo	1,800	122,975	—
FROM FLOUR STORE :—			
Beans Flour	4,600	—	—
Poonac Flour	25,490	—	—
Groundnnt Cake Flour	34,350	—	—
Cotton Seed Cake Flour	51.585	116,025	—
FROM MOLASCUIT DEPARTMENT :—			
Molascuit and Brancuit	—	102,525	—
FROM BLOOD MIXING DEPARTMENT:—			
Dry Blood Mixture	850	—	—
From Animal Feeding Stuff Department (remixed)	3,800	4,650	—
To Animal Feeding Stuff Department	—	—	415,481
Industrial Loss	—	—	19
		415,500	415,500

Statement of "Animal Feeding Stuff" processed during the financial year ending 30th June, 1954—contiuued

	Kilos	*Kilos*	*Kilos*
ANIMAL FEEDING STUFF DEPARTMENT:—			
Stock on 1.7.53	2,650	—	—
From Mixing Department	415,481 (net)	—	—
Empty Gunnies	7,130	425,261	—
Sales	402,311 (gross for net)	—	—
Sent to mixing (remixed)	3,800	—	—
Balance of Stock on 30.6.54 ...	19,150	—	425,261
		425,261	425,261

Crushing of Poonac ... 3,000 kilos for Animal Husbandry Officer.

Manufacturing account of Animal Feeding Stuff Department for the year ending 30.6.54

Dr.	Rs. c.	***Cr.***	Rs. c.
To Stock on 1.7.53	230,814 81	By Stock on 30.6,54	267,663 19
To purchases	181,590 98	By cost of production transferred to Trading account ...	162,946 98
To wages and bonus ...	13,224 21		
To aloe thread	271 81		
To coal	401 00		
To jute bags	900 00		
To transport (inwards)	12 00		
To electricity	3,395 36		
TGTAL ...	430,610 17	TOTAL ...	430,610 17

Trading account as at 30th June, 1954

	Rs. c.		Rs. c.
To cost of production from Manutacturing account ...	162,946 98	By sales	196,925 31
By gross profit transferred to Profit and Loss accounl ...	34,048 33	By grinding of poonac ...	70 00
TOTAL ...	196,995 31	TOTAL ...	196,995 31

Profit and Loss account as at 30th June, 1954

	Rs. c.		Rs. c.
To stores	2,792 00	By gross profit from Trading account	34,048 33
To petty supplies	383 50	By transport by lorry	1,162 25
To refund on Contract Tickets ...	71 50	By refund by Crown Agents ...	47 16
To insurance	530 82		
To timber and planks	1,044 19		
To travelling	394 34		
To motor spirit	561 84		
To railway	722 12		
To depreciation of lorry (1/5 of Rs. 8,907 51) ...	1,781 51		
To salaries of staff : Rs. 13,170 00			
To net profit c/f Rs. 13,805 92	26,975 92		
TOTAL ...	35.257 74	TOTAL ...	35,257 74

Balance Sheet of Animal Feeding Stuff Department as at 30th June, 1954

Liabilities			*Assets*		
	Rs c	Rs c			Rs c
Accumulated profits...	56,891 61		Stock of commodities		267,663 19
Add profit 1952/53 ...	43,134 69		Aloe thread		486 94
		100,026 30	Coal		229 00
Accountant General (advance) ...		216,853 38	Stores		1,516 69
Salaries of staff ...	13,170 00		Lorry	8,907 51	
Net profit c/f ...	13,805 92		*less* depreciation...	1,781 51	
		26,975 92			7,126 00
			Cubing and Pelleting machine ...	47,057 77	
			add cost of new installation	19,776 01	
					66,833 78
		343,855 60			343,855 60

S. STAUB,
Sugar Technologist.

Legislation

The following Proclamation and Government Notice were issued during the year :—

Proclamation No. 13 of 1954 ...	To proclaim the rate of duty leviable under the Central Board (Cost of Administration), Ordinance 1951, on the Sugars of the 1953 crop exported from the Colony.
Government Notice No. 94 of 1954	Tobacco (Consolidation) (Amendment) Regulations 1954.

1030/3/56—750